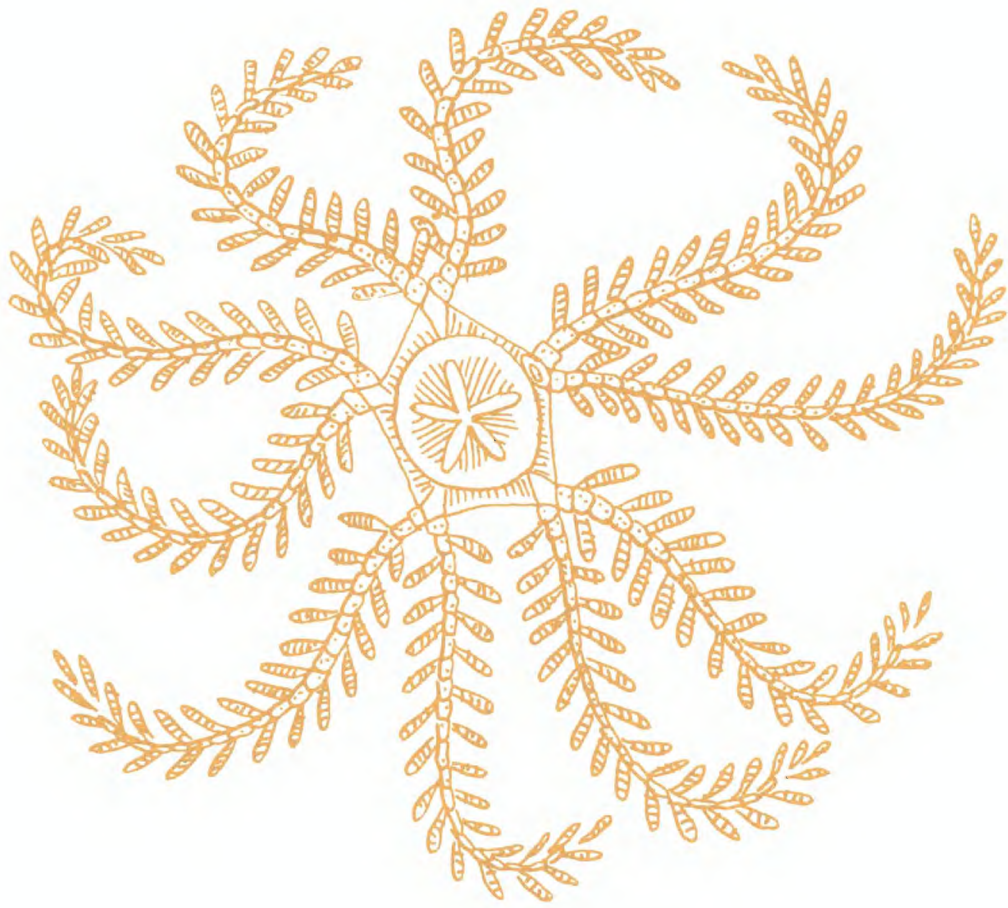






BECOMING A MEMBER

We need and we welcome new members. There are many advantages for all concerned. If you are not a member, won't you fill out and forward the form on the reverse? And if you are a member, won't you pass it along to others in your family — or to your friends?

APPLICATION FOR MEMBERSHIP

I wish to make application as a member in the

(see classification below)

California Academy of Sciences.

Name

Address

Regular Membership\$10

Family Membership

(all members of one household) ..\$15

Contributing Membership\$25

Subscribing Membership\$50

Annual Sponsor\$100

Life Membership\$250

ANNUAL REPORT OF THE CALIFORNIA ACADEMY OF SCIENCES 1965-1966

BOARD OF TRUSTEES.....	2
REPORT OF THE DIRECTOR.....	4
STAFF	24
STAFF PUBLICATIONS	26
CONTRIBUTORS	28
FINANCIAL STATEMENT	30
SPECIAL GIFTS AND BEQUESTS.....	33

BOARD OF TRUSTEES:

As of June 30, 1966

CHAIRMAN:

Alan J. Galloway

VICE CHAIRMEN:

Brooks Walker

I. W. Hellman

PRESIDENT:

A. Starker Leopold

Kenneth K. Bechtel

Stephen D. Bechtel, Jr.

Eugene D. Bennett

Victor J. Bergeron

James B. Black, Jr.

Ian Campbell

Ralph Emerson

Gregory A. Harrison

William R. Hewlett

VICE PRESIDENT:

J. Wyatt Durham

TREASURER:

E. Morris Cox

SECRETARY:

Siemon W. Muller

Francis C. Hutchens

Mrs. Ernest R. Lilienthal

John W. Mailliard, III

Wilson Meyer

Mrs. Joseph A. Moore, Jr.

Charles H. Russell

H. P. Stewart

Thomas Tilton

Ira L. Wiggins

HONORARY TRUSTEES:

Francis P. Farquhar

Mrs. Joseph C. Fennelly

Daniel E. Koshland

Decker G. McAllister

Charles Page

T. S. Petersen

Mrs. Henry Potter Russell

Dean Witter

SECRETARY TO THE BOARD: Paul G. Brislawn



REPORT OF THE CHAIRMAN OF THE BOARD

THE fiscal year 1965-66 was one of steady although unspectacular advance by the California Academy of Sciences. A number of things were accomplished which have been in our plans for some time, as a result of which the Academy will benefit in the years to come.

For many years the Academy has urgently needed additional facilities, expanded exhibit space and more efficient administrative offices. To obtain these we have looked forward to the day when the Academy quadrangle could be completed with the construction of what was called the "facade" building. This has been envisaged ever since the North American Hall was first constructed in 1916. It will soon become a reality as a result of a grant from the S. H. Cowell Foundation, as mentioned in last year's report. During the past year the Foundation generously increased the amount of its grant to \$1,550,000 to cover the anticipated actual cost of the proposed building.

Mr. Milton T. Pflueger, who designed our J. W. Mailliard, Jr., Memorial Library, has been selected as architect. The project is now in the planning stages and we anticipate construction will start next spring. Thus the visionary "facade" building will now take shape and substance and will be known as "Cowell Hall."

The work and accomplishments of the Academy are due not only to the staff but also to the assistance extended by many individual, government and corporate friends. Without such cooperation the work would not be possible.

The Academy has been fortunate in enjoying excellent relations with the City and County of San Francisco in the persons of the Mayor, members of the Board of Supervisors and many individuals in the governmental organization including the various Commissions with which we deal. The City and County, in accordance with the provisions of the Charter, have supplied the funds required to operate and maintain the Steinhart Aquarium and most of the public exhibits. We are grateful to very many people in the City and County organization for their sympathetic help and cooperation.

During the past year, more than 100 public-spirited business organizations, trusts and foundations have continued their generous support of the Academy's work. These are listed on pages 28 and 29 of this report. The funds so obtained have provided the nucleus around which much of the Academy's research has been developed and thus have made a direct contribution to the advancement of science.

Gifts have also been received from a number of generous individuals. Some of these have been for special purposes; others for unrestricted use, including operations; and still others, including an anonymous gift of \$24,000, have been added to the Endowment Fund.

In recent years the Academy has been fortunate in receiving numerous bequests varying individually from as little as a few dollars to as much as several hundred thousand dollars. Combined, they provide funds, most of which have been placed in the Endowment Fund, the income from

which is vital to the Academy's existence. Currently the Endowment Fund amounts to about \$2.4 million. I would like to recommend to all readers of this report that they too consider the importance of the Endowment Fund and take steps to make sure to include the Academy as a beneficiary in their wills. Further suggestions about such bequests or other special gifts are presented on the last page of this report. If we could raise the total of this fund to \$10 million within the next few years, the Academy would be in a position to increase the salaries of its research and administrative personnel to a more appropriate level, have sufficient income to finance desired scientific expeditions, and have a reserve against "the slings and arrows of outrageous fortune."

This report would be incomplete without my paying respect to that hardworking but often unsung body, the Board of Trustees. These men and women are busy members of the community. They give freely of their valuable time and experience to help guide the affairs of the Academy.

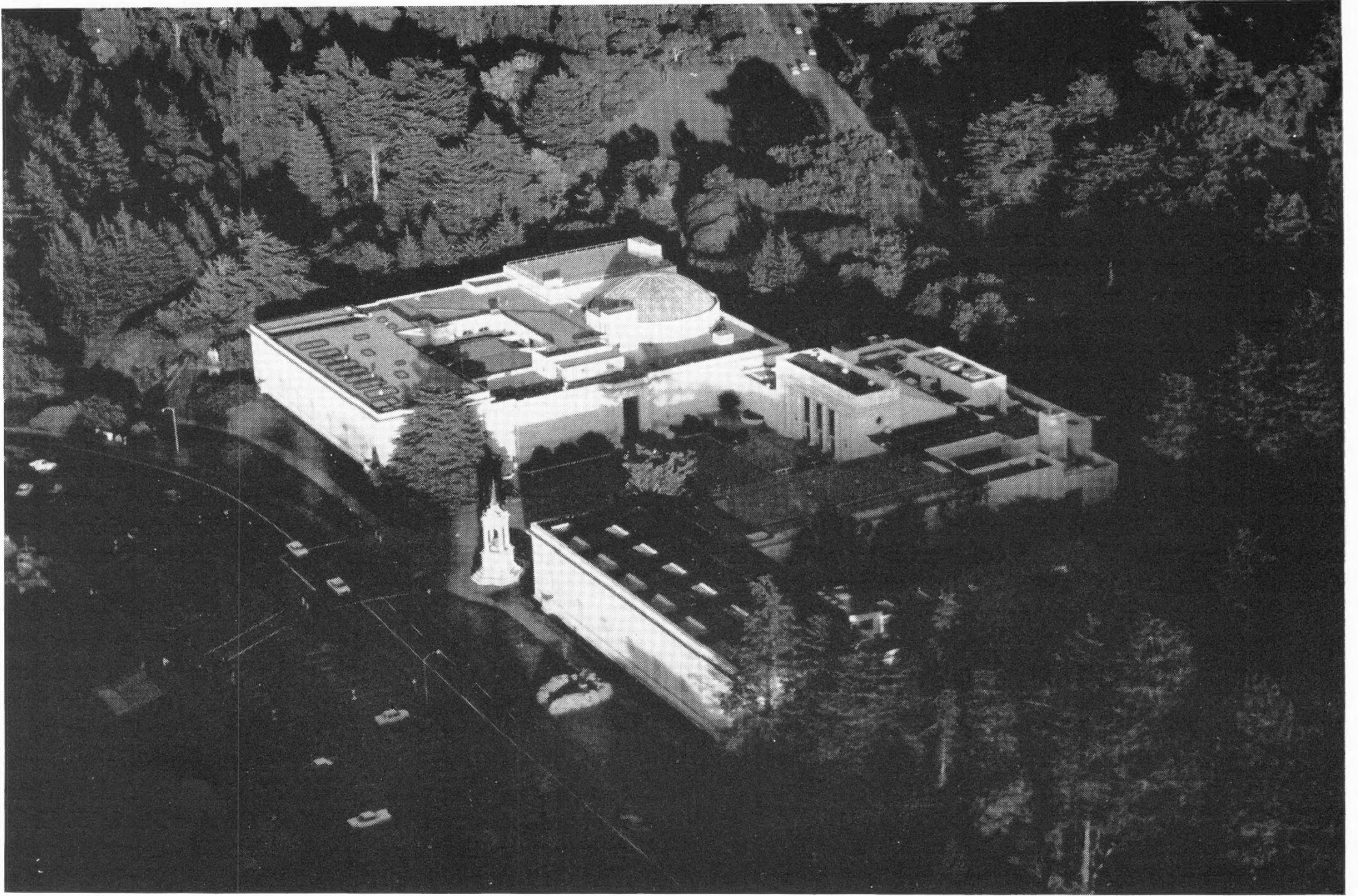
During the past year we were honored to welcome as a new member to the Board, Mr. Thomas Tilton of the firm of Kaemper and Barrett. Last October Mr. I. W. Hellman, former Chairman of Wells Fargo Bank, was elected a Vice Chairman of the Board and Mr. K. K. Bechtel, Chairman of Industrial Indemnity Corporation, became a member of the Executive Committee. Recently, we received with much regret the resignation of Mr. William R. Hewlett, President of Hewlett-Packard Company, who has been appointed to the President's Science Advisory Board. The President's gain is our loss.

Since the close of the Academy's fiscal year the Academy lost one of its most devoted and valued members, Mrs. Henry Potter Russell, a Fellow and an Honorary Trustee who had served the Academy as an active Trustee from 1946 to 1964. Throughout her association with the Academy, her advice and counsel and devotion to the Academy's objectives were an inspiration to all concerned. Her death was not only a loss to the Academy but to the community which she served in so many different ways.

In conclusion let me urge you to read the summary of the Academy's work during the past year as presented on the following pages by our Director, Dr. George E. Lindsay, under whose able and hard-working leadership our day-to-day scientific and educational programs are conducted. I think you will agree much has been accomplished which has been beneficial not only to San Francisco, California, and the United States, but also to the scientific community throughout the world.



ALAN J. GALLOWAY
Chairman, Board of Trustees



REPORT OF THE DIRECTOR

THE YEAR covered in this report period, July 1, 1965, through June 30, 1966, was a good one for the California Academy of Sciences. Once again, more than three million people came to visit the Academy's Steinhart Aquarium, the Halls of Science, and the Alexander F. Morrison Planetarium. Academy scientists worked in the field from Alaska to Brazil. Scientific papers totaling 1532 pages were published. The monthly Members' Meetings became so popular that the 425 seats in Morrison Auditorium could no longer accommodate the audience, and double sessions were started.

Much of the progress of the year, however, does not yet show. Architects developed plans for Cowell Hall, a striking addition to the Academy building complex, and the S. H. Cowell Foundation increased its pledge of funds for the building from \$1,250,000 to \$1,550,000. The Research Committee concluded a long study in depth of the research program of each of the seven scientific departments and presented its reports and recommendations to the Science Council. A new Hall of Minerals, scheduled to be opened in 1967, has occupied the attention of the Exhibits Department much of the year.

This is a report of the activities and condition of the California Academy of Sciences.

SPECIAL EVENTS

The Annual Meeting of the Academy was held October 6, 1965. After a brief business session, the motion picture "Museum," a documentary film about the Academy, was previewed. At the same time, behind-the-scenes tours were conducted through the Aquarium, the Departments of Herpetology, Botany, and Exhibits, and the Instrument and Print shops. Refreshments were served to approximately 900 guests in Simson African Hall.

Dr. Laurence M. Klauber, a Fellow of the Academy and a Trustee of the San Diego Natural History Museum and the San Diego Zoo, was the recipient of the Fellows' Medal for 1965. This was awarded in recognition of his great contributions to the biosystematics of reptiles, particularly of rattlesnakes. The presentation was made by Academy President A. Starker Leopold and Director George E. Lindsay at the annual Fellows' Banquet held on November 10.

The Belvedere-Tiburon Landmarks Society and the Marin County Board of Supervisors honored our Curator of Botany by the establishment of the John Thomas Howell Botanical Garden on the Tiburon Peninsula. The resolution of the Supervisors, adopted July 26, 1965, read (in part)



"whereas, the efforts of John Thomas Howell . . . were a major factor in the acquisition and preservation, identification, and recognition of the flora of Marin County and . . . the Tiburon Peninsula . . . this Board does hereby order and declare that said County real property shall henceforth be known as and is hereby officially designated the 'John Thomas Howell Botanical Garden.'"

The Thirteenth San Francisco Bay Area Science Fair was open to the public March 26-30. As in previous years, all available space in African Hall and the Science Museum was turned over to the students who had been selected to exhibit their projects. Attendance during the Fair was 53,679.

The San Francisco Aquarium Society Annual Fish

5

Left, the Academy complex as it appears at present. In planning is Cowell Hall, which will extend across the facade of the Academy from African to North American Halls, thus enclosing the courtyard. Right, Academy Director George E. Lindsay and President A. Starker Leopold presenting the 1965 Fellows' Medal to Laurence M. Klauber in recognition of his contributions to the systematics of reptiles. Below, a sample of the 55,00 students who came to Morrison Planetarium last year to view the special student shows.





Associate Director Robert T. Orr, above, judging one of the exhibits at the Science Fair. Below, the panel of science fair judges, invited from business and industry as well as schools and colleges, being briefed before judging the exhibits.



Show was held in North American Mammal Hall May 28-30. Aquarists from all over the West came to this show and thousands of prize fishes were displayed.

A new permanent exhibit, "John James Audubon," was presented in the foyer of the Science Museum. The focal point of the display is one volume (of four) of the elephant folio of Audubon's *Birds of America* which is but part of the splendid Edward E. Hills and Florence Hopkins Hills Collection of Botanical and Ornithological Works recently bequeathed the Academy. One of the 435 colored plates in *Birds of America* will be on view at all times, changed on occasion, so the public may enjoy the true magnificence and scope of Audubon's achievement.

FIELD WORK AND EXPEDITIONS

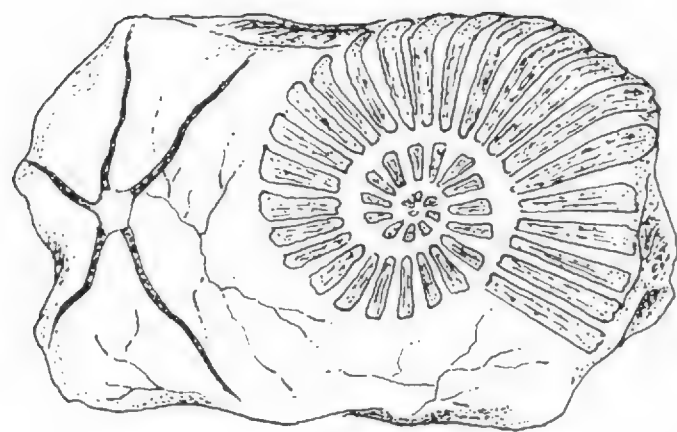
Active field exploration for new knowledge about our planet is an Academy tradition. The major expedition for 1965 was a survey and investigation of the biological results of the March 27, 1964, earthquake in southwestern Alaska. Dr. G Dallas Hanna headed a team of investigators who worked in Prince William Sound from May 25 to August 12, using the Motor Vessel *Harmony*. This project was sponsored by the National Science Foundation and the Atomic Energy Commission, and was undertaken at the request of the National Academy of Sciences.

Dr. Earl S. Herald participated in the month-long Aquarium of Niagara Falls Expedition to the Amazon for the purpose of field study and capture of live fishes and freshwater dolphins (*Sotalia* and *Inia*). The recent addition of "Buddy," an *Inia geoffrensis*, to Steinhart Aquarium is one result of that trip.

The field work of the Oaxaca Project of the Department of Ornithology and Mammalogy, which continued for more than a year, was completed at the end of August 1965. Messrs. Raymond Bandar and Luis Baptista collected mammals in Oaxaca in July and August, and Mr. Stuart Rowley finished his twelve months of bird investigation and collecting on August 31. This project, an ecologic, biogeographic, and taxonomic study of the fauna (particularly birds of the Sierra de Miahuatlán) was under the direction of Dr. Robert T. Orr, Associate Director of the Academy, and is a cooperative endeavor with the Western Foundation for Vertebrate Zoology and the American Museum of Natural History.

There were two expeditions to the Gulf of California during this report period. The first under the leadership of Dr. Robert T. Orr was in the southern Gulf August 9-20, 1965, and emphasized marine collecting and photography. A large collection of living fishes and other marine animals was brought back to Steinhart. The trip was supported by the Bechtel Corporation, Mr. Bruce Markham, Mr. Roy E. Marquardt, and Mr. Richard Adcock. The islands of Espíritu Santo, Patrida, Las Animas, and Cerralvo were visited, as were several shore stations on the Baja California peninsula.

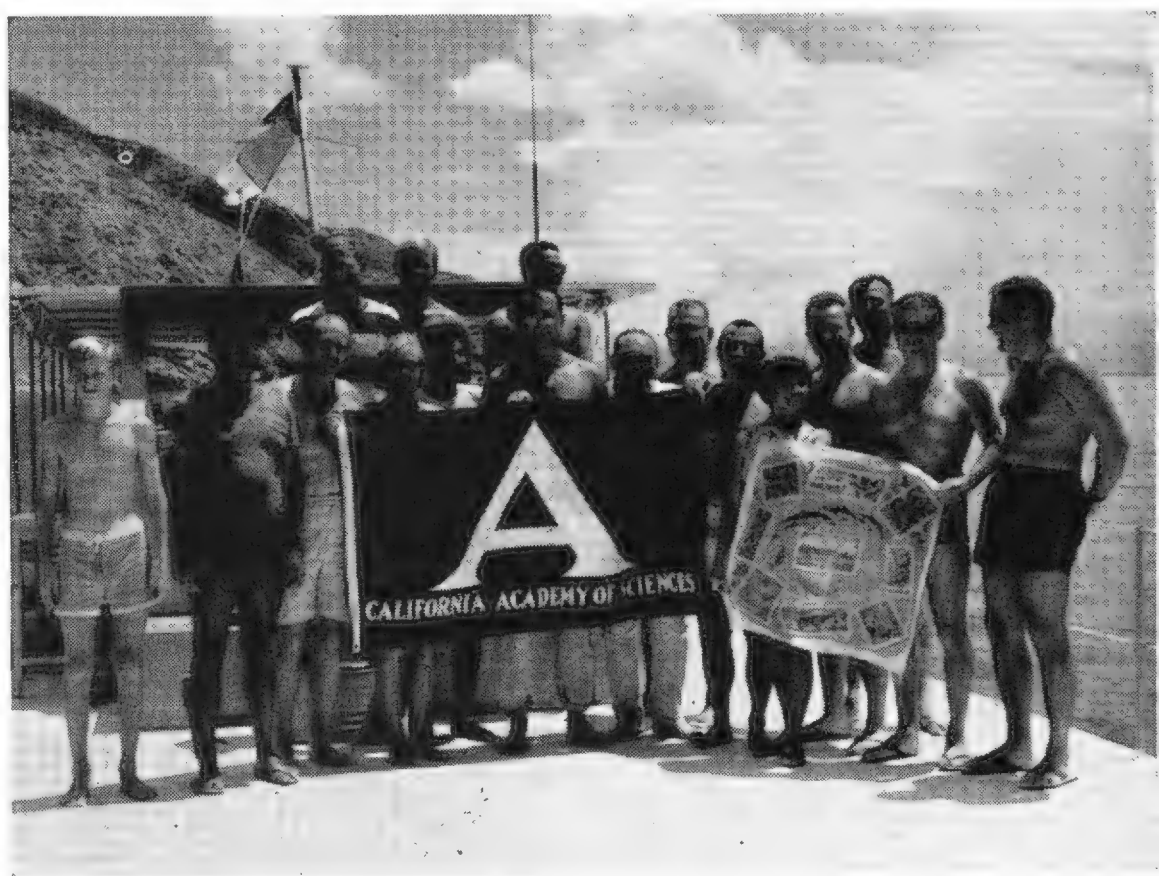
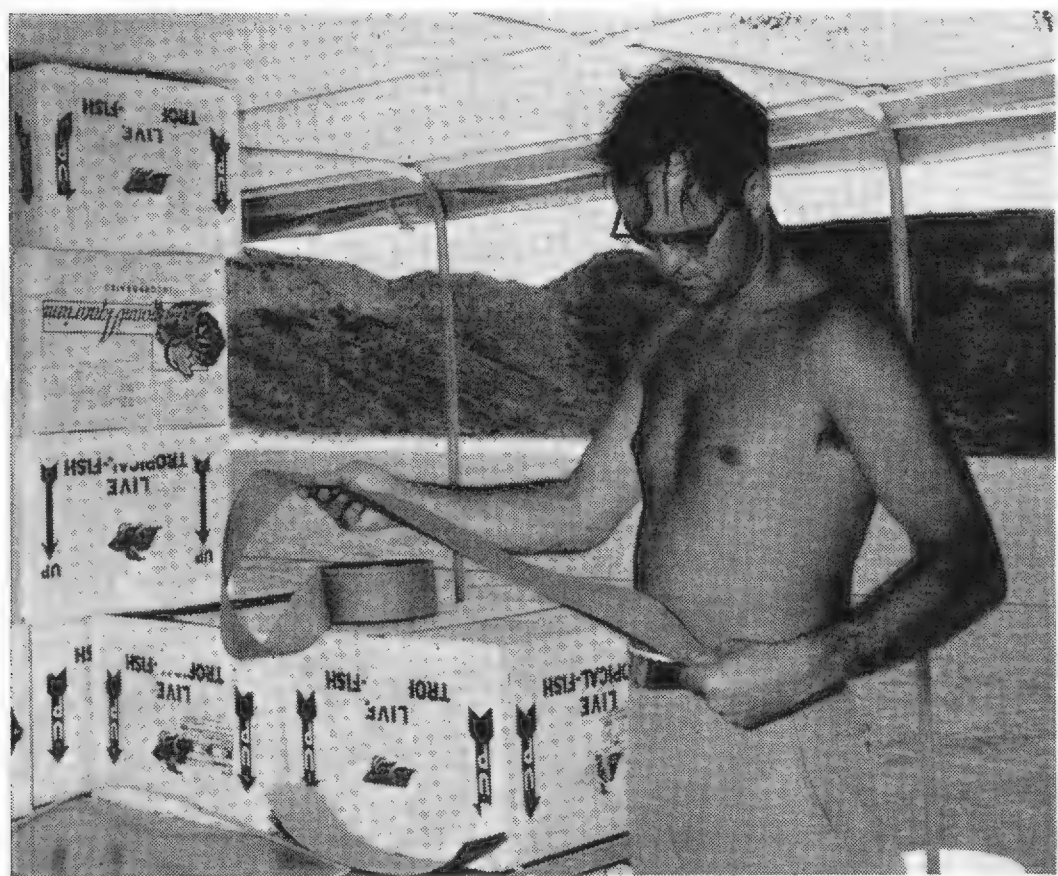
On April 19-29 the Gulf Islands Expedition of 1966 worked the north central Gulf of California. This was a joint excursion with the San Diego Natural History Museum, and was supported by the Belvedere Scientific Fund and the National Science Foundation. Academy representatives were George E. Lindsay, Robert T. Orr, Tom Tilton, Dustin Chivers, Ken Lucas, Raymond Bandar, and Luis Baptista. Richard P. Phillips, Reid Moran, Richard C.



Banks, and Allan J. Sloan represented the San Diego Natural History Museum, and Alejandro Villalobos F. and Virgilio Arenas the Instituto de Biología of Mexico. Collections were made on Angel de la Guarda, Mejía, Granite, Pond, Tiburón, Patos, Turner, San Pedro Mártir, San Esteban, San Lorenzo Sur, Salsipuedes, Raza, and Partida del Norte Islands.

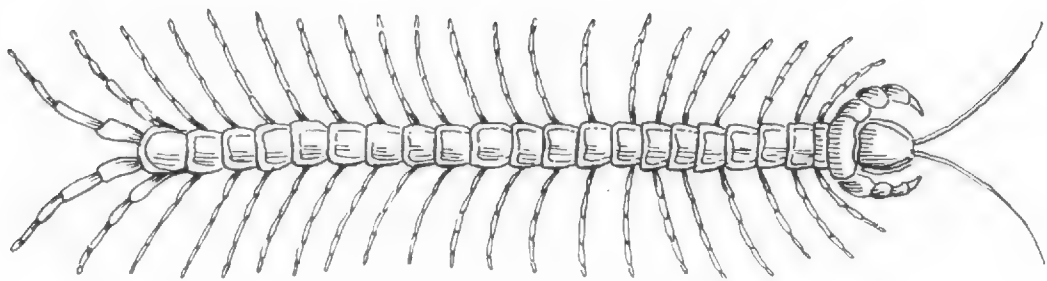
Just as the Academy year closed Edward S. Ross, Curator of Entomology, Mrs. Ross, Clark Ross, and Kenneth Lorenzen departed on a major expedition to central west Africa and were joined subsequently by H. Vannoy Davis, a Fellow of the Academy. This expedition, which took its own field vehicle and will probably be gone a year, will concentrate on insects and photography.

7



From the 1965 and 1966 Gulf of California expeditions: Upper left, Walt Schneebeil preparing boxes for carrying live fish back to the Academy. Upper right, group photo of the 1965 expedition aboard the "Marisla" with the Academy flag.

Lower left: Bruce Marquardt, Ken Lucas, and Dustin Chivers examining invertebrates brought up from one of the offshore collecting stations. Lower right, the 1966 expedition ship "San Augustin II" at anchor off Isla San Esteban.



RESEARCH DEPARTMENTS

Research, and the publication of the results of that research, have been the primary functions of the California Academy of Sciences since its founding in 1853. The casual museum visitor is usually not aware of these important activities, but herein lies the basis for the Academy's expanding reputation in the international scientific community.

Systematic biology in the broad sense is the function of each of the seven scientific departments. The preservation for research workers of large collections of specimens which show the diversity and variability of organisms, both recent and fossil, is an essential responsibility of our institution. The tools of biosystematic research are by no means confined to specimen cases, however, and many other techniques and procedures are used in each of the Academy departments.

For example, the unique facilities of Steinhart Aquarium for studies of behavior, physiology, and other aspects of living aquatic organisms are used not only by Academy scientists but also, on a regular and continuing basis, by researchers from the University of California and San Francisco State College.

BOTANY

John Thomas Howell, Chairman and Curator. The Botany Department dates from the founding of the Academy and the interest of Dr. Albert Kellogg and Dr. Andrew Randall. The herbarium contains 459,386 mounted

or accessioned specimens. Accessions during the year totaled 11,535; 7632 by gift, 2081 by exchange, 600 by purchase, and 1222 from staff collections. Among noteworthy gifts were those of Robert F. Hoover, of H. Dwight Ripley and R. C. Barneby, and of Ernest C. Twisselmann. Dr. Hoover has given the Academy more than 5000 specimens, including a number of types and isotypes, which are the basis of his flora of San Luis Obispo County. The Academy received the first set of Kern County plants collected by Mr. Twisselmann, the vouchers for his flora of that area. During the year, his gift totaled more than 1600 specimens and during the past three years the total has been over 4000. Very significant collections were also received from Gordon True, Lewis Rose, and Peter Rubtsoff. Dr. and Mrs. Robert T. Orr, who have charge of the fungus collections, added 138 specimens during the year.

The herbarium is world-wide in scope, but is chiefly noted as a source of research material for floristic and monographic studies of western North American plants, studies of the flora of the Galápagos Islands, the cultivated plants of northern California, and taxonomic and historical studies of California weeds.

Mr. Howell continued his studies of the flora of the Sierra Nevada both in the herbarium and in the field. He also resumed work on 1600 samples of vascular plants of the Galápagos Islands and continued studies of new and old weeds and cooperated in their detection and control with State and Federal botanists.

Associate Curator Elizabeth McClintock continued a research project, in cooperation with the Bailey Hortorium of Cornell University, in assisting with the preparation of *Hortus Third*, a principal reference work of cultivated



The California Botany Club, which has its headquarters in the Botany Department, had about 40 meetings and field trips led by Mr. Howell.



Elizabeth McClintock consulted reference books and herbarium specimens, as well as living plants, in her work with the preparation of "Hortus Third."

plants. She has completed the manuscripts for about 20 plant families. Dr. McClintock concluded, with Walter and Irja Knight and Philip Wheeler, the field work necessary for a flora of San Bruno Mountain. Additional field studies were conducted in Chiapas and Oaxaca, Mexico, the Pixley Natural Area in Tulare County, and other California localities. She spent one week studying the genus *Erythrina*, and other plants used as ornamentals in California, at the herbarium of the Instituto de Biología in Mexico.

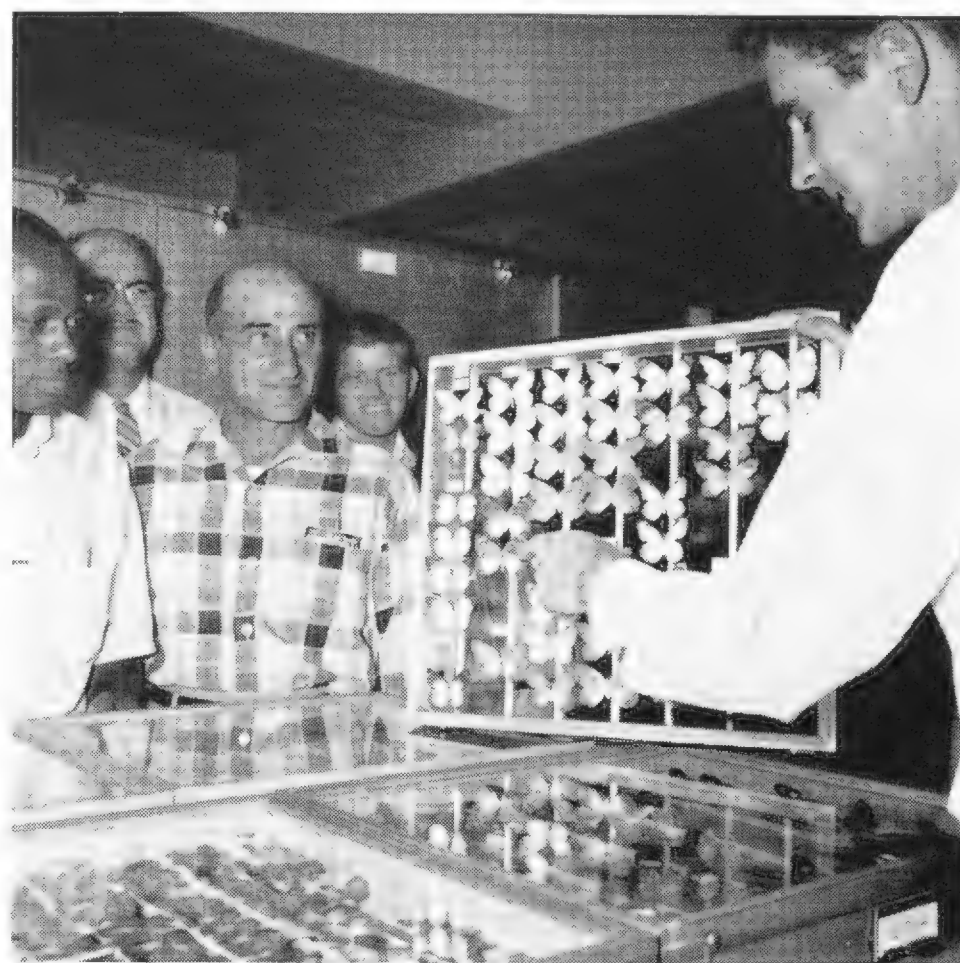
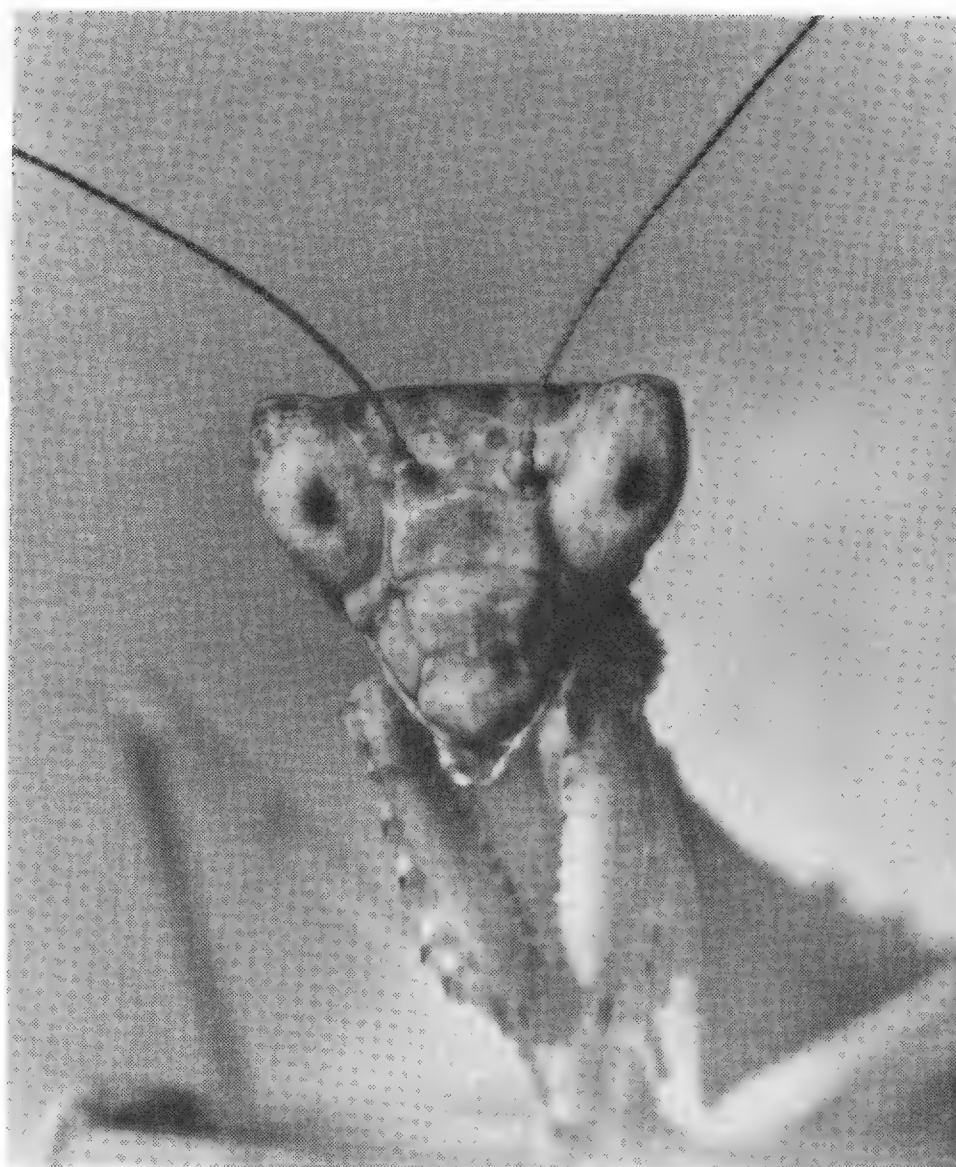
The Botany Department is the headquarters of the active California Botanical Club, which during the year had about 40 meetings or field trips, which Mr. Howell led. The club gives important support to the department through its gifts, which this year included maps, books, and additions to the department's endowment fund. Many members of the club are faithful volunteer workers.

Botany Department personnel provide hundreds of routine identifications and supply other needed information to the public, the City of San Francisco and other governmental agencies. Extensive loans of specimens are sent to researchers all over the world, and many advanced students and specialists are resident investigators in the herbarium for periods of a few days to many months. For example, during the month of May 1966, there were 102 visitors to the department. During the year, 1337 specimens were loaned to 26 workers.

Six regular staff members assisted the curators, as did twice that number of Research Associates and volunteer assistants. Mr. Lewis S. Rose, a regular volunteer for more than thirty years, devotes four days each week to filing the plants in the herbarium, preparing exchanges, collecting exchange material, maintaining a bibliographic file for western American vascular plants, and performing other essential activities. Miss Marjorie Hart has repackaged and filed the entire collection of more than 10,000 bryophytes, and during the past year completed work on 3864 specimens of Hepaticae. Dr. Hans Leschke has assumed curatorial care of the large and important collection of *Carex*. Mrs. Robert T. Orr has curatorial responsibility for the mycological collection. Mrs. Leona Fick and others contribute heavily of their time. Their generous help has made possible many of the refinements which characterize the effectiveness of the Academy herbarium.

ENTOMOLOGY

Edward S. Ross, Chairman and Curator. The Entomology Department maintains the largest of the Academy's research collections, which is the most important assemblage of insects in western North America. It contains



Top, praying mantis photographed by Edward S. Ross. Above, David Cavagnaro showing a tray of specimens to one of the many groups that visited the Entomology Department.

3,543,245 fully prepared specimens, 198,766 of which were accessioned this year. Of these 41,365 came as gifts. The remainder was from earlier expeditions and purchases. There are approximately 1,500,000 additional specimens on hand to process.

The collection is universal in scope, but beetle, thrips, and Embioptera are particularly well represented. It

is a research resource used by many scientists and advanced students. Specimens loaned for research purposes during the year totaled 91,820 in 286 separate transactions. About 550 entomologists visited the Entomology Department for varying lengths of time. Other guests included people with specimens for identification, university students in class groups, and casual visitors.

Such heavy use by researchers is gratifying, but inevitably presents serious problems to the staff of the department, who must devote their time to servicing the loans and assisting the visiting investigators. As a result, much of their own research is done on their own time. Additional staff for this department is essential, when our budget will permit.

Dr. Ross continued his work on a monograph of the Embioptera, and at the end of June, 1966, departed for a year of field work in the Guinea region of Africa. Associate Curator Hugh B. Leech spent many weekends collecting in California, using his personal camper, and took a long vacation-collecting trip through Arizona, New Mexico, Colorado, and Wyoming to visit and re-collect at water beetle type localities. Associate Curator Edward L. Kessel's field trips were concerned with the biology and distribution of platypezid flies. He traveled northwestern British Columbia in a special land yacht, and coastal Alaska by steamer and bicycle. Assistant Curator Paul H. Arnaud made many local collecting trips, one to southern California, and a research trip to the eastern United States from May 11 through June.

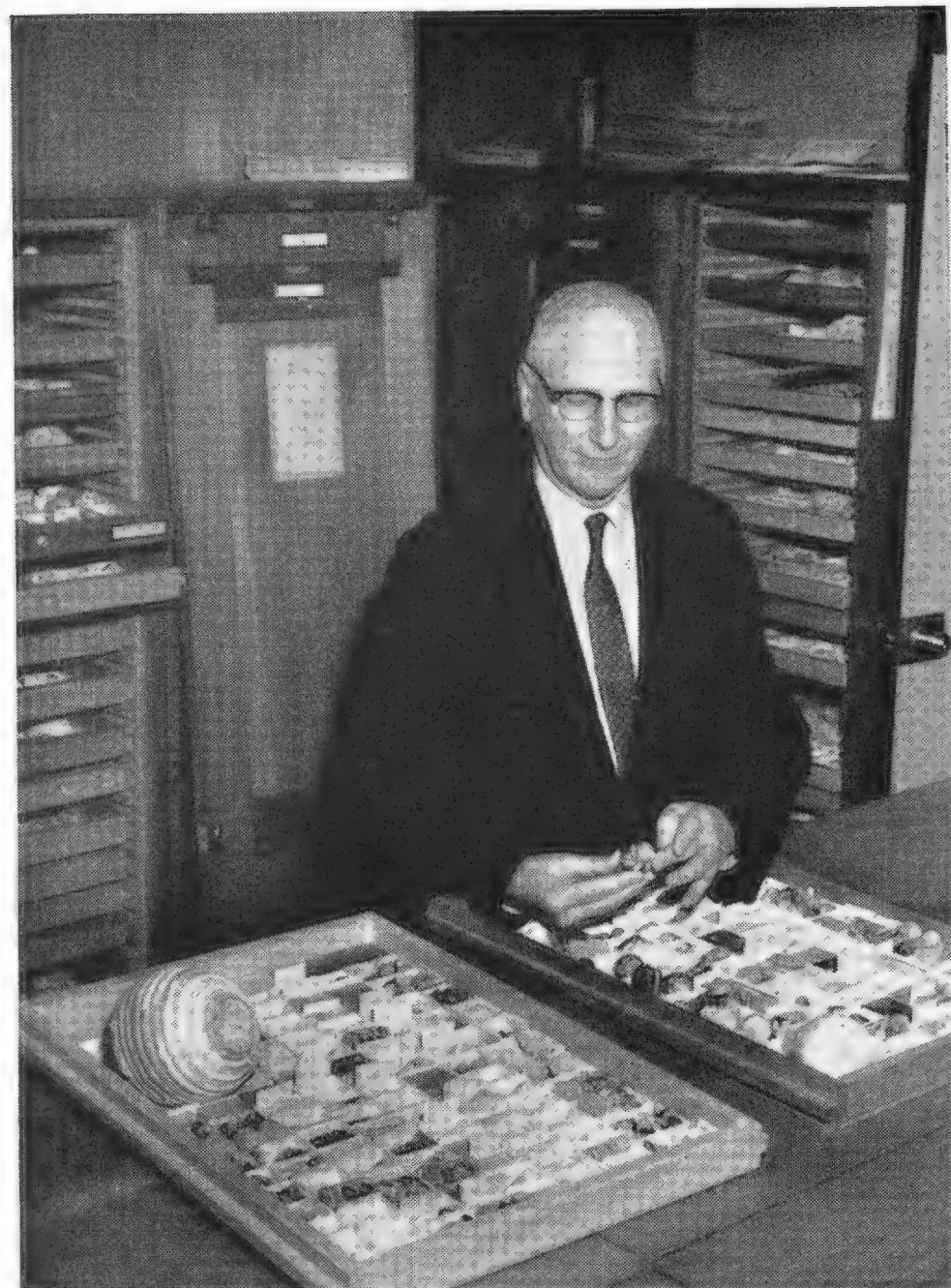
Dr. Arnaud has undertaken the production of a "Host Catalog of the North American Tachinidae" under an Academy contract with the U.S. Department of Agriculture. From April 1966, half of his time for the next two years will be devoted to the project.

Mr. David Cavagnaro processed much of the material preserved in alcohol from the Ross-Cavagnaro Asian Expedition of 1961-62. Mr. John W. Green finished sorting a backlog of insects pinned and labeled earlier under a National Science Foundation Facilities Grant concluded in 1965. He also continued mounting other materials.

Dr. C. Don MacNeill completed the reorganization of the Lepidoptera collection before he left the Academy in July 1965 to take a position with the Snow Museum in Oakland.

Dr. Arnaud rearranged the Diptera collection, and was responsible for the insect type collection, which exceeds 8,800 specimens. He added 216 holotypes, 58 allotypes, and one neotype during the year.

In addition to her other duties, Mrs. Stella E. Tatro, secretary of the department, completed the reorganization of the entomological library.



Leo G. Hertlein continued his research on invertebrate fossils, especially Recent marine mollusks of the Galapagos islands. Tray in photo shows tropical marine shells from the western Pacific.

GEOLOGY

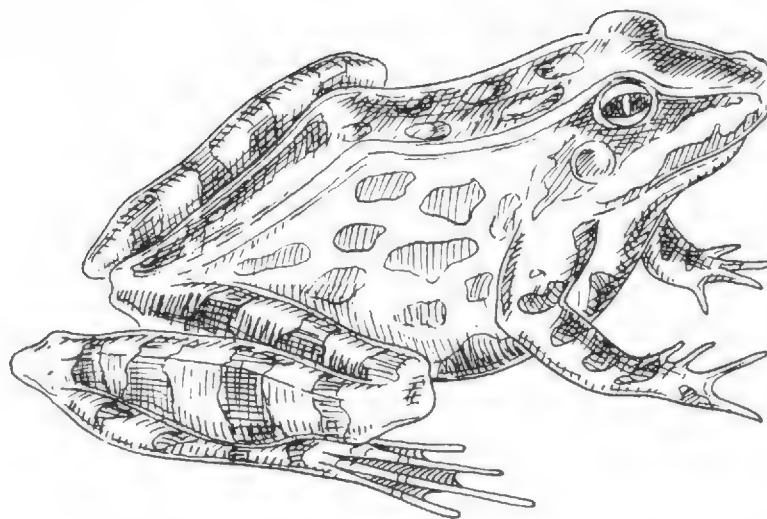
G Dallas Hanna, Chairman and Curator. Leo G. Hertlein, Curator of Invertebrate Paleontology. This department has large and important collections of megafossils and microfossils, including a very significant assemblage of diatoms. In addition, there are extremely valuable collections of Recent mollusks from tropical west America and the islands of the eastern Pacific, especially the Galápagos Islands, and more than 5000 minerals.

The type collection contains 1,814 holotypes, 309 syntypes, and 1,299 paratypes.

The major portion of Dr. Hanna's time during 1965 was occupied with a field trip to Alaska (May 25 to August 12) and the preparation of a report dealing with an in-depth study of the biological results of the massive earthquake investigated on that trip.

Dr. Hertlein maintained the general paleontological and type collections. He continued his research on the invertebrate fossils, and also worked on the identification of the Recent marine mollusks of the Galápagos Islands.

Honorary Curator of Minerals Charles W. Chesterman selected display specimens for the new Hall of Minerals. Miss Mary Elizabeth Chesterman spent part time cataloging rocks and minerals collected since 1960.



HERPETOLOGY

Alan E. Leviton, Chairman and Curator. The herpetology collection had 102,802 cataloged specimens on June 1, 1966, an increase of approximately 2300 during the year. Sixteen holotypes and more than 300 paratypes were added to the type collection. Among the accessions were important materials from Saudi Arabia, donated by Field Associate John Gasperetti; from Greece, donated by Mr. and Mrs. Richard J. Clark; from New Guinea and the Solomon Islands, resulting from a cooperative venture with the Museum of Comparative Zoology, Harvard University; from West Africa, collected by Ted Papenfuss; from Pakistan, collected by Jeromie A. Anderson; and from Colorado, donated by Research Associate Benjamin H. Banta. The anatomical section received Research Associate Malcolm R. Miller's entire collection of cochlear ducts of lizards.

Fifty-five loans, involving 2554 specimens, were made to various museums and universities during the year.

The research activities of Dr. Leviton and Assistant Curator Steven C. Anderson centered about the systematics and zoogeography of Asian and southwestern Asian reptiles and amphibians, as well as selected groups of South Ameri-

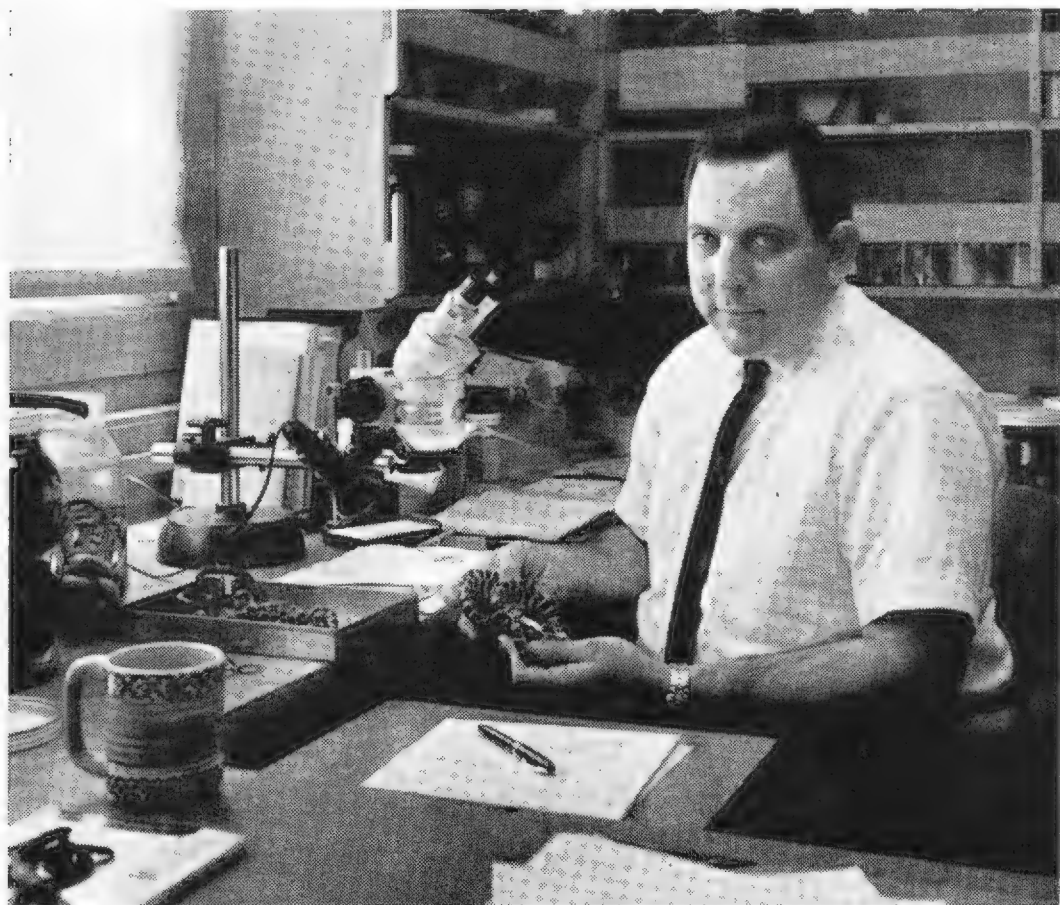
can frogs. Dr. Anderson completed a manuscript on the systematics and zoogeography of the lizards of Iran; Dr. Miller completed the first phase of his comprehensive study of the inner ear of lizards; Dr. Fred Schuierer finished his study of physiological adjustments of selected serum proteins in *Bufo boreas* to environmental stresses; Dr. Leviton completed several shorter manuscripts concerned with Philippine snake genera; and Leviton and Anderson completed their review of the singular skink genus *Ophiomorus*.

Both Dr. Anderson and Dr. Schuierer, who carried on their doctoral research programs at the Academy, received their Ph.D. degrees from Stanford University in 1966. Dr. Leviton, who holds an appointment as Lecturer in Biology at Stanford, and Research Associate George S. Myers, Professor of Biology at Stanford, were their advisors. This is an example of the Academy's cooperation with serious students and with neighboring universities.

In July 1965, Professor Myers donated to the Academy his important collection of biographical, historical, and portrait materials dealing with natural history.

Dr. Leviton, as chairman of the Research Committee and secretary of the Science Council, headed a study of the scientific departments of the Academy and submitted his report to the Director on April 5, 1966.

Alan E. Leviton worked on the systematics and zoogeography of Asian reptiles and amphibians, and studied several genera of Philippine snakes.



An especially interesting addition to the herpetological collections is the rattleless rattlesnake, which lives on Santa Catalina Island in the Gulf of California.





Lillian Dempster and W. I. Follett have been compiling revised lists of ichthyological names. Here they are examining the skeletal structure of a right-eyed flounder.



Allyn G. Smith has been processing several collections of invertebrates already received. Here he is comparing measurements of two species of sand crab.

ICHTHYOLOGY

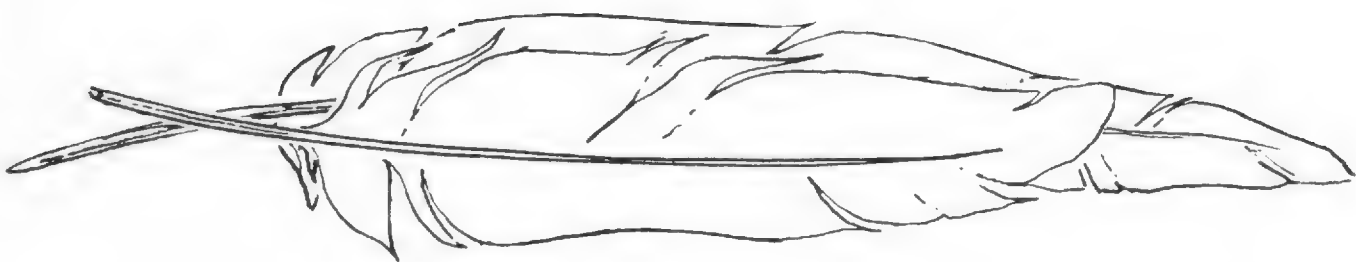
W. I. Follett, Chairman and Curator. Some 10,500 specimens of fishes were accessioned during the year. Outstanding among these were a specimen of an undescribed species of poacher from Monterey Bay, California, presented by John Hopkirk and Larry G. Harris; two paratypes of the Red Sea pipefish *Siokunichthys bentuviai* from Eugenie Clark; eight paratypes of *Grasseichthys gabonensis* from Jacques Géry; a specimen of the Pacific sandfish, *Trichodon trichodon*, from J. Gary Smith; a specimen of the Pacific sleeper shark, *Somniosus pacificus*, from Daniel Gotshall; and other specimens of special interest from about 20 other donors.

Mr. Follett and Associate Curator Lillian Dempster indexed the Journal Copeia, and compiled a list of the ichthyological and herpetological names and works on which the International Commission on Zoological Nomenclature has ruled since the publication (in 1958) of the several Official Lists and Indexes. Mr. Follett continued his work on several ethnoichthyological projects and on a revision of the list of fishes of California. He conducted 13 field trips in California, and five were made by Mr. John D. Hopkirk, Curatorial Assistant.

The large collection of fishes in the Academy's Department of Ichthyology, together with the unusually fine

facilities of the Steinhart Aquarium for the keeping of live fishes, make the Academy an ideal center for research in various phases of fisheries biology. Over a period of years investigations of this nature have been carried on by the Academy under contract with State and Federal agencies. During the fiscal year 1965-66 three such contracts were in effect.

One of these was a contract with the California State Marine Research Committee for coordination of the California Cooperative Oceanic Fisheries Investigations (known for convenience as CALCOFI), involving work being carried on by five different agencies—the California Academy of Sciences, the California Department of Fish and Game, the Hopkins Marine Station of Stanford University, the Scripps Institution of Oceanography of the University of California, and the United States Fish and Wildlife Service. The coordinator, employed by the Academy with funds provided by the State, was Dr. Garth I. Murphy. Dr. Murphy's work in this connection terminated December 31, 1965, at which time he accepted appointment as Professor of Oceanography in the University of Hawaii. During Dr. Murphy's employment by the Academy he wrote an extensive paper, now in press, entitled "Population Biology of the Pacific Sardine (*Sardinops caerulea*).\" Fisheries biologists who read this paper in manuscript expressed the opinion that it was an outstanding study of fisheries population dynamics.



A second contract with the Marine Research Committee has been for a study of the food and feeding habits of the northern anchovy (*Engraulis mordax*). This study has been carried on by Mr. Anatole S. Loukashkin, who has made microscopic analyses of the stomach contents of anchovies from various localities at different seasons, supplemented by observations of feeding behavior of anchovies in the Steinhart Aquarium and by observations at sea aboard the research ship *Alaska* of the Department of Fish and Game.

A contract with the U.S. Fish and Wildlife Service has also been in effect for the sampling of fish populations in areas where specific information is needed. Fisheries research contracts are coordinated by Senior Scientist Robert C. Miller.

INVERTEBRATE ZOOLOGY

Allyn G. Smith, Chairman and Associate Curator, Robert C. Miller, Curator. The Department of Invertebrate Zoology receives significant support through National Science Foundation grant GB-4353. Its principal activity during the year was the processing of the former Stanford University invertebrate collection, the MacFarland collection of opisthobranchs, and accessioning material collected by Technical Assistant Dustin P. Chivers and other members of two Academy expeditions to the Gulf of California.

The collection of invertebrate animals now includes about 30,000 lots, an increase of approximately 14,000 over last year. This is in addition to a large collection of dried specimens which have not been counted. There are about 300 specimens in the invertebrate type collection, an increase of nearly 100 during the past year.

Mr. Smith collected land and freshwater mollusks and other invertebrates in central Oregon in July, 1965. Mr. Chivers made many local collecting trips, particularly working the earthquake fault ponds now being drained, their partially endemic faunas thus being doomed.

Additional important accessions were received from Charles R. Stasek, M. and Mme. André De Roy of the Galápagos Islands, Raymond Bandar, Eugene Coan, A. N. Golikov, Robert Kiwala, F. S. McNeil, Gale Sphon, R. R. Talmadge, Spencer R. Thorpe, Jr., Don Wobber, and others.

Mrs. Kathleen Kamiya was added to the staff as Technical Assistant. Dr. Charles R. Stasek, Assistant Curator, presented a paper at the Second European Malacological Congress at Copenhagen, Denmark. He also took a leave of absence to give a six-week summer session course in invertebrate zoology at the University of California, Berkeley.



These skulls of male California sea lions were gathered together from a number of institutions for studies of growth rate and age determination.

ORNITHOLOGY AND MAMMALOLOGY

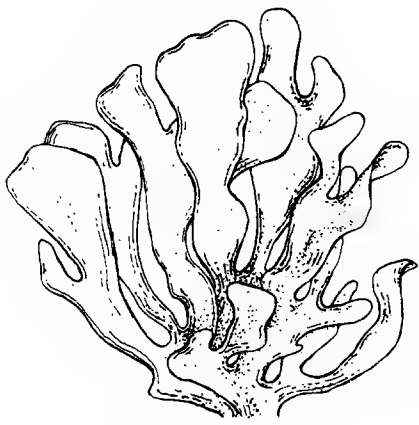
13

Robert T. Orr, Chairman and Curator. The collections include approximately 85,000 bird skins, 20,000 sets of eggs, 18,000 mammal skins, and skeletal material. Loans active during the year numbered 28, with 765 specimens going to 21 United States and foreign institutions.

The collection is richest in material from the Galápagos Islands, California, British Columbia, Mexico, Panama, Manchuria, and East Africa. Duplication with specimens in the Museum of Vertebrate Zoology at Berkeley is minimal and the collections are complementary. Staff and space needs for this department are critical, and must be taken care of as soon as our budget will permit.

Few specimens were accessioned during the year, though many were acquired. The material from the Oaxaca project is being worked up, and will be divided with the Western Foundation of Vertebrate Zoology and the American Museum of Natural History. A selection of duplicate specimens has been sent to the Department of Wildlife of Mexico.

An outstanding acquisition was a skull of a goose-beak whale, *Ziphius cavirostris*, purchased from Mrs. C. F. Bishop, who found it at San Luis Gonzaga Bay, Baja California. It represents the first record of this species for Mexico.



Stuart Rowley completed his year-long direction of the field portion of the Oaxaca project at the end of August 1965. This study of the birds and other elements of the biota of the Sierra de Miahuatlán was supported by Mr. Ed N. Harrison, the Sanford Trust of the American Museum of Natural History, and several Academy sources. The total amount of money provided for this activity was \$12,464 for the period from September 1, 1964, to August 31, 1965. During the summer of 1965 Raymond Bandar and Luis Baptista collected mammals in that area, under grants from the AAAS and the Academy Augsbury Fund.

Technical Assistant Jacqueline Schonewald processed the Oaxaca material so that it is available for study. She also participated in a project which compared the cranial characters of the Pacific coastal and Gulf of California populations of the California sea lion, and performed the usual maintenance chores of a large collection.

Volunteer Joy Bailey worked in the department three days each week, starting in February, and in the ensuing months completed the identification of a collection of 2000 birds from Guerrero, Mexico. Subsequently she started to catalog them and was largely through this project by the end of the fiscal year.

Dr. Orr, in addition to the duties of his department, devoted much time to administration in his capacity as Associate Director of the Academy. However, he continued work on the organization of a report on the birds of the Sierra de Miahuatlán, based on the results of the Oaxaca project. He also completed a paper on Galápagos sea lions, recorded two cetacean strandings from the coast of North America, and began compiling the data from three years of field notes taken on Año Nuevo Island, California, on the life history of the Steller sea lion. He was in charge of an Academy expedition to the southern Gulf of California on August 9-20, 1965, and participated in the one to the northern islands April 19-29, 1966.

EDUCATIONAL SERVICES

EXHIBITS

Mearl F. Carson, Chairman and Curator. As has been pointed out by Albert Eide Parr, dean of American museologists, "the need for public and popular natural history museums, as we see them today, is actually to a large degree the product of industrialization and urbanization. In the unnatural environment of a modern town or metropolis, the natural history museum adds pleasure, satis-

faction and diversity to the life of city children, and city dwellers of all ages by mental recreation it offers through its exhibits and its activities. It enriches life by creating a curiosity about nature which it can only partly satisfy, leaving an increased urge to seek satisfaction in nature itself A museum that undertakes to explain the familiar things in nature gives pleasures that do not end with the museum visit, but repeat themselves a million times in everyday life beyond its walls. It does not merely serve the functions of a traveling poster stimulating the spirit of adventure in young and old. It vastly enriches the adventure itself."

Three million people come to the Academy each year. These visitors are amazed by the diversity and beauty of the fishes in the Aquarium, they stand in rapt silence before the water hole habitat group in Simson African Hall, and they lose themselves in the imaginary universe created by the magic of Morrison Planetarium. In a few pleasant hours of recreational education they gain an understanding and appreciation of man's world and his environment they could receive at no other place and in no other way.

The very fact that the Academy is the most popular cultural institution in the western United States, and that three million people invest time and energy to visit its halls, creates an obligation to improve constantly the quality and scope of the information presented here. The Exhibits Department is aware of that obligation and continually strives to achieve excellence.

Twelve permanent and forty temporary exhibits were installed during the year. The most impressive of the permanent additions was the John James Audubon display located in the foyer of the Science Museum. Its focal point is one of the elephant folio volumes of Audubon's *Birds of America* from the Academy's Edward E. Hills and Florence Hopkins Hills Collection of Botanical and Ornithological Works. In concept and technique this exhibit, which was designed by Ron King, marked an exciting departure from the traditional approach of many natural history displays. The great new mineral hall, which is being prepared in the North American wing and is scheduled to open in 1967, will also utilize imaginative display techniques.

Four new presentations were added in Fossil Hall, which now nears completion; two were installed in North American Mammal Hall; and two were added in the Hall of Astronomy.

Outstanding temporary exhibits in the Lovell White Hall of Man and Nature were "Photomicrographs" by Stennett Heaton, dazzling color photographs of insect morphology taken through a microscope; "The Tarahumara Indians" by Sam Coombs; "Beauty in Wilderness" by C. Edward Graves; "Diary of a California Mountain," a parti-



A new hall of public exhibits—Fossil Hall—is nearing completion, with several panels of exhibits added this year. Above, display of fossil mammals. Above right, family tree showing the evolution of fish-like vertebrates. These exhibits were designed and constructed by the Department of Exhibits. Right, members of the staff shown here are Jean Pitts, Ron King, Mearl F. Carson, Charles Dornbach, and Tim O'Leary.



cularly perceptive record by John Olmsted; and "Camouflage in Nature" by our Curator Edward S. Ross. New display cases were added to accommodate Dr. Ross's magnificent exhibition, which will remain through 1966.

"The Triads," a comprehensive story of America's exploration of space created by the National Aeronautics and Space Administration, was one of the largest temporary exhibits ever displayed at the Academy. It covered 1600 square feet of floor space in African Hall and included full-size replicas of satellites and the Mercury spacecraft. This was on view in December and January.

HOROLOGY

Bruce A. Kock, Honorary Curator of Horology. This department has the primary responsibility for the Wil-

liam Barclay Stevens collection of timekeeping devices, much of which is on permanent exhibit in Astronomy Hall. Mr. Kock performed, on a volunteer basis, all of the functions of the curator of that collection. He visited important science museums, including Franklin Institute, the U.S. Naval Observatory, the Smithsonian Institution, and the American Philosophical Society, to determine latest thinking and display techniques in horological exhibits. He acquired a Riefler astronomical clock from the Naval Observatory and is directing its restoration. He was science advisor and participated in the Science in Action film "To Tell the Time." He gave numerous lectures and was tireless in providing technical advice and services to many museums, other institutions, and individuals. In addition, Mr. Kock donated many navigational instruments and timekeeping devices to the Academy collection.



ALEXANDER F. MORRISON PLANETARIUM

Thomas M. Gates, Manager. A total of 1146 planetarium shows was presented during the year. Of these, 954 were regular public shows which had an attendance of 140,552, and 192 were special shows given for 47,714 students. Total attendance at the planetarium was 188,266.

Government aid to education has made possible the construction of many planetaria in high schools and community colleges. While these are comparatively small installations with limited capacity for special and dramatic effects, they serve the educational needs of many areas which formerly transported students to Morrison Planetarium. Some of them give performances for the public as well. However, the quality and versatility of our great planetarium projector have not been duplicated and Academy technicians are constantly developing new instruments which provide the special effects that make the Academy shows unique in quality and interest.

The most popular program of the year was "The Mystery of Stonehenge," which broke records for attendance and public interest. That dramatic presentation combined the appeal of one of the most fascinating and mysterious archaeological sites and new discoveries about an ancient human culture. The show could only have been presented in a major planetarium.

The adult education program continued to expand and improve during the year. Five courses were given, three in the fall semester of 1965 and two in the spring of 1966. These included 32 hours of *Celestial Navigation* which Captain David W. Todd, Jr., USN (Ret.), gave to each of four classes; *Astronomy Appreciation I* which Michael Bennett taught both semesters; and *Observational Astronomy*, a twenty-hour course given in the fall by Thomas Gates and Michael Bennett.

Research Associate Clay P. Butler, Thomas Gates,

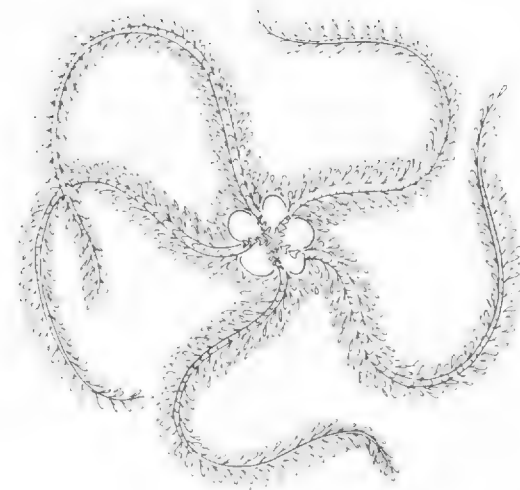
and Michael Bennett made a field trip to the Barringer meteor crater in Arizona on April 2-10. Mr. Butler had obtained permission for the Academy to retain any specimens which the party might find. Four working days at the crater netted 54 meteorite specimens with a total weight of more than eight pounds, and these will be valuable for exhibit and research purposes.

The Morrison Planetarium is one of the public service departments of the Academy. It replied to more than one thousand written requests for information, and answered thousands of telephone questions. It advised other planetaria on equipment and procedures, and devised a packet of information which was sent to museums and school districts which contemplate installing planetaria. Tours of the planetarium and shop facilities were given to visiting astronomers, planetarium officials, and other interested people.

STEINHART AQUARIUM

Earl S. Herald, Associate Director for Steinhart Aquarium. It can be said unequivocally that our aquarium is the first and primary attraction for most visitors to San Francisco and Golden Gate Park. June 28 of this year marked the third anniversary of the complete rehabilitation of Steinhart Aquarium. During those three years, 9,381,663 persons passed through the glass and bronze doors to the watery wonders beyond. By way of celebrating this third re-birthday, an evening open house was arranged for the populace and 1829 enthusiastic fish fanciers paid a nighttime visit.

The most noteworthy single event during the year was the arrival of a second freshwater dolphin from the Amazon. He was "Buddy," a gift from the Aquarium of Niagara Falls, and he provided some much needed companionship for our favorite "Whiskers." Buddy was the frosting on Steinhart's re-birthday cake.



During October 1965, Dr. Herald joined an expedition arranged by the Niagara Falls Aquarium to study fishes and freshwater dolphins in the vicinity of Manaus, Brazil, in the central Amazon. The film record of this trip has become part of the syndicated Westinghouse TV Adventure series under the title "Quest for the Sacred Dolphin."

Under grants from the U.S. Fish and Wildlife Service, the staff continued studies of the effects of silicone-type glazing materials upon aquatic organisms as well as ultraviolet sterilization of fresh water systems. Other staff studies included temperature tolerance tests of South American piranha to see if they would survive the temperate waters of North America.

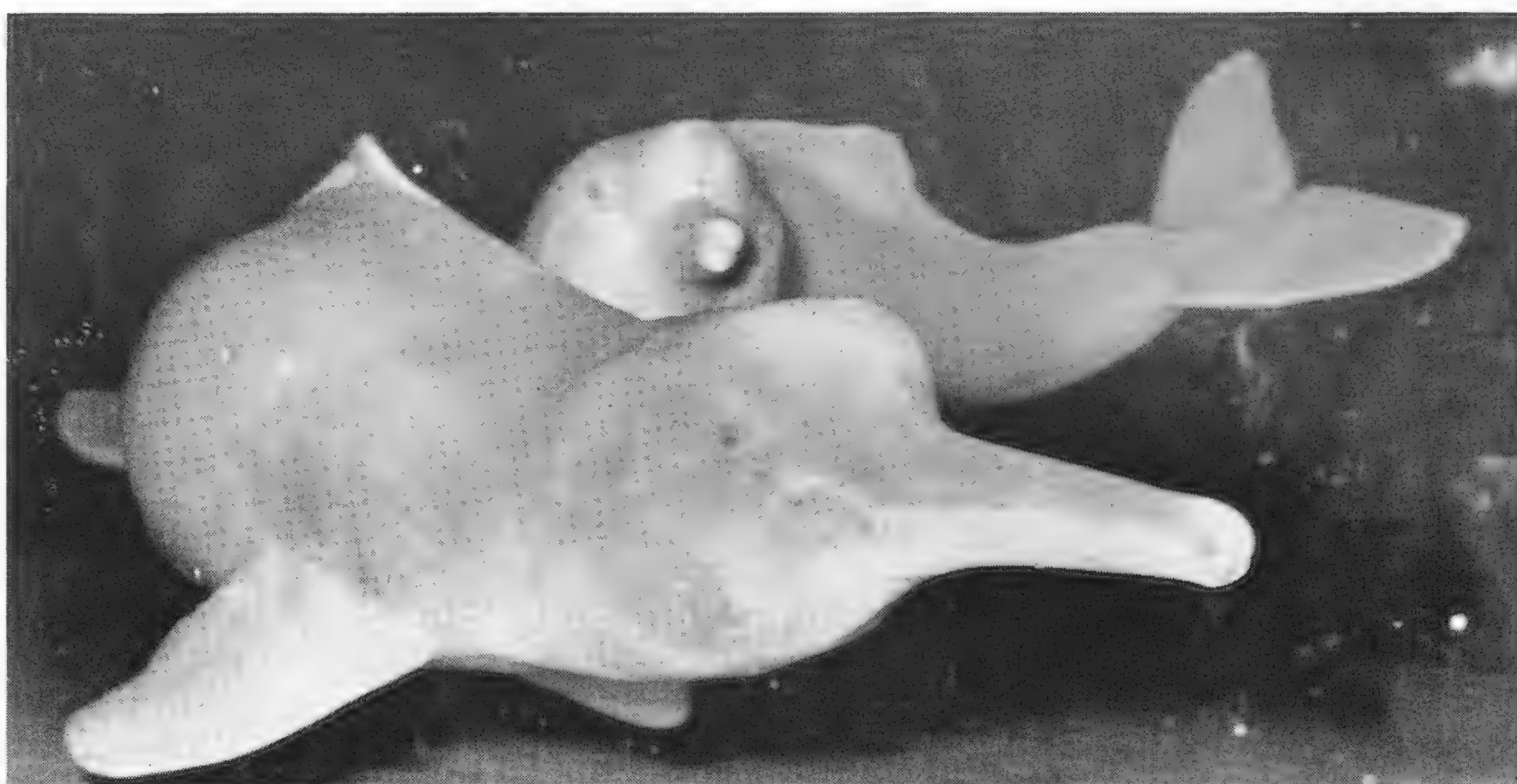
Other new exhibits included some 90 lamprey eels as well as a pair of Volga River sturgeon which arrived from far-off Bergen, Norway. The latter, originally, were the property of Nikita Khrushchev and part of a Bergen exchange arranged by Academy member Jeff Meyer. Aquarium Field Associate Elkan Morris, who normally resides in Alaska, forwarded major collections of reptiles and amphibians from his trips to Fiji, Australia, Formosa, Hong Kong, and Thailand. Significant collections were also received from Ted Papenfuss in Africa.

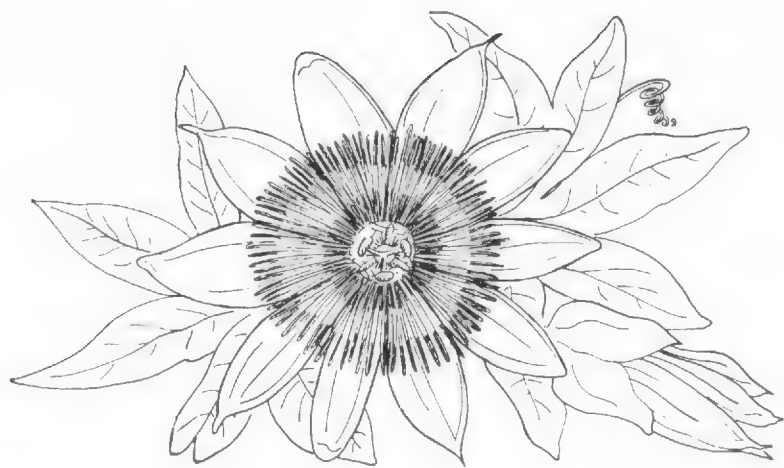
Richard Tenaza, a student of social behavior of diving birds, brought in cormorants and murrelets to add to the marine dolphin tank.

Left, Michael Bennett at the Planetarium console. Right, from the Amazon came our second freshwater dolphin, "Buddy" who is now a companion for "Whiskers."

Below, each week the alligator pool receives a thorough cleaning.

Below right, Bill Kelley of Aquarium Systems, Inc., and Earl S. Herald holding the tigerfish that bit Dr. Herald while on an expedition to the Amazon.





In cooperation with Dr. Alan E. Leviton of the Department of Amphibians and Reptiles, the staff also continued studies of plasma proteins of elasmobranch fishes. Another project has been that of Dr. Ben Papermaster's group from the University of California at Berkeley which has been using many of the aquarium facilities in studies of additional serological characteristics of the blood of sharks and other fishes.

TELEVISION

"Science in Action," the Academy's venerable television program, was this year produced by Science Films, Inc. While retaining ownership and control of the program, the Academy was relieved of the very considerable expense of production and distribution. As a result and for the first time in several years, net income was realized from television and applied against past losses.



Study Guides for "Science in Action" were distributed to more than 22,000 high school teachers around the country, mostly in California.

Several of the programs featured the Academy or Academy activities. One entitled "Museum: A Portrait of the California Academy of Sciences" has been used for information and promotion; "Field Trip" with Robert T. Orr recorded an Academy expedition to the Gulf of California; "Aquarium" with Earl S. Herald told about Steinhart Aquarium; and "Planetarium" with Thomas Gates and Michael Bennett examined the history of Morrison Planetarium. "Insect Safari" was about Edward S. Ross's African Expedition, and "To Tell the Time" with Bruce A. Kock took a close look at the clock collection. "The Flowering Desert" was filmed in the field in Arizona and Baja California with George Lindsay.

Many other areas of science were explored, from Bay Area Rapid Transit to delicate ear surgery and, as in past years, the program reached thousands of viewers in California and other parts of the United States. There are presently no plans for producing an additional series of "Science in Action" but arrangements have been made to rerun the best of past shows in a number of domestic and foreign areas.

The one-hour documentary film, "Sea of Cortez," has been screened in Morrison Auditorium every Saturday and Sunday for nearly two years. A new feature, "Expedition," is being produced by Dr. David Parker for Morrison Auditorium use. It will show Academy field activities in various parts of the world.

J. W. MAILLIARD, JR., LIBRARY

Ray Brian, Librarian. In its quiet way, the library continued its efforts to secure the most essential literature reporting original results in the natural and earth sciences—either by purchase or by exchange.

The library served the research staff, the membership, faculty members and graduate students from nearby colleges, and other visitors with special needs. By inter-library loans, the geographical sweep of service extended from Louisiana to North Carolina to Wyoming. Most assistance, however, was given to scholars in university, college, industrial, research and special libraries in California, by correspondence, telephone and personal visits.

A major addition this year was the Leverett Mills Loomis—Mary McLellan Davidson Terry Library, a selection from the personal libraries of a former director of the Academy and a former assistant curator of ornithology. It included some 20 cartons of journals and books which enriched the library holdings considerably. Dr. Elizabeth McClintock of the Botany Department contributed a scholar's working collection of dictionaries, histories of botany,



Left, Ray Brian with a sumptuously bound and illustrated copy of Gould's "Birds of Europe," one of many rare books in the Hills Collection. Below left, Miriam Barnett checking accessions of new numbers of periodicals. This card index contains data on the more than 5000 scientific periodicals received regularly by the library on exchange or by purchase. As such, it constitutes the heart of the Academy library. Below, Paul Anderson, one of several volunteers who assist greatly in the work of the library.

19

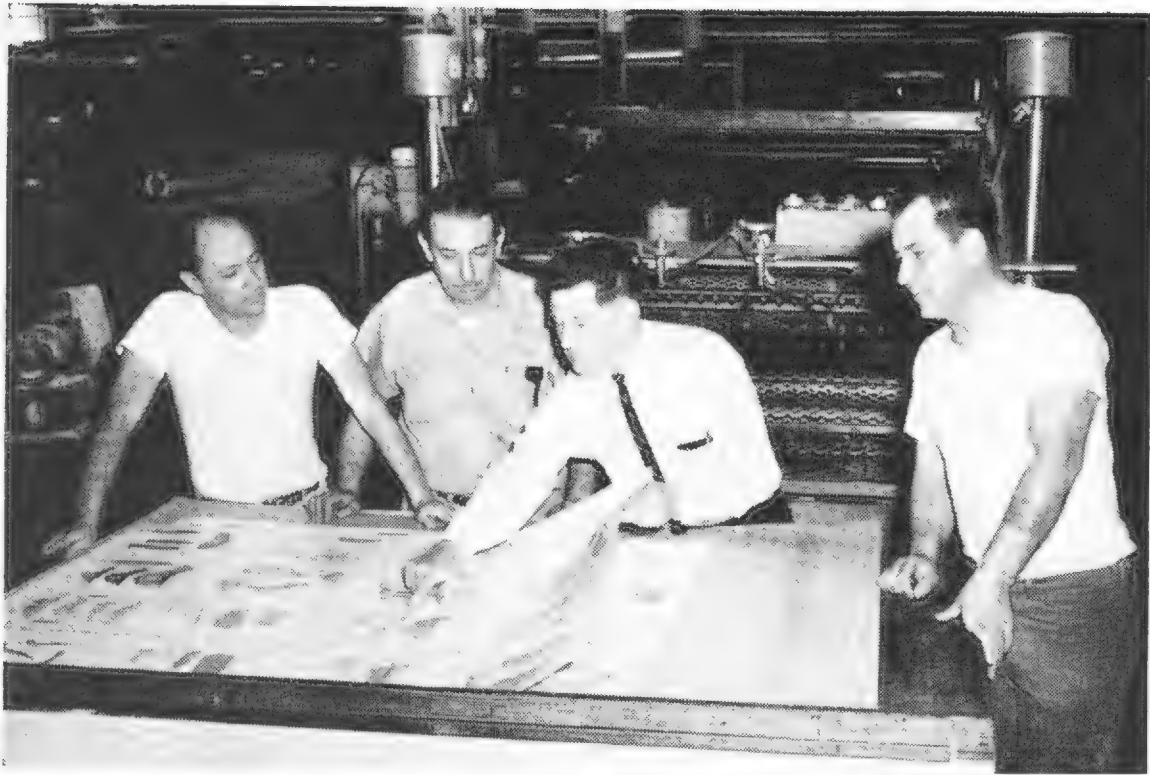


floras, manuals, horticultural works, and technical journals. Mr. Alexandre Chnéour continued his generous giving of entomological works from his own research library; Dr. Dwight Taylor contributed general scientific journals; and the University of Oregon donated valuable horticultural reports.

The purchase of a photocopying machine made possible by a special Christmas contribution enabled the staff to provide a service not previously available.

Volunteer binding by Mr. Anson Herrick reached a new high as he almost doubled the number of volumes bound free for the library—actually 92 separate books plus

four difficult rehabilitation jobs. The increasingly skillful help given by regular volunteer workers was of immeasurable assistance. These faithful included Mr. Paul Anderson, Mr. Julian Arntz, Miss Jessie Saunders, Miss Ellen Siensen and Mrs. Pat Smith. A Canadian, Mrs. Elizabeth Kipling, found herself temporarily stranded in San Francisco because of a change in vacation plans. For two months she regularly contributed typing assistance and her parting gift was an almost complete index to our records of accessions. Mrs. Margaret Campbell continued her invaluable labors with the letters and manuscripts of many legendary Academy figures.



Color plates for the MacFarland Memoir were printed by the H. S. Crocker Company on a two-color Harris offset press. Pressroom staff is here checking press sheet for register and color.

SCIENTIFIC PUBLICATIONS

Edward L. Kessel, Editor. Research without the publication of the results of that research is sterile. The scientific productivity of a man or of an institution is judged by his or its contributions to the literature. The technical publications of the Academy are the public record of its scientific work.

All manuscripts submitted for the technical publications are reviewed by each member of the Committee on Publication which includes George E. Lindsay, Edward L. Kessel, and Leo G. Hertlein. Opinions of specialists in the particular field of the paper are usually obtained. Approval or rejection of a manuscript, the priority for its publication if it is acceptable, and other decisions are made by the committee.

The technical publications of the California Academy of Sciences for the year ending June 30, 1966, totaled 1532 pages. There were ten *Occasional Papers* (338 pages), twenty numbers of the *Proceedings* (648 pages), and a 546-page *Memoir* by Frank Mace MacFarland.

This *Memoir*, "Studies of the Opisthobranchiate Mollusks of the Pacific Coast," was a new landmark in the Academy's program of scientific publication. Dr. MacFarland, who was long a Stanford University professor and also was President and Acting Director of the Academy, was the leading authority on the large and extremely beautiful group of shell-less marine mollusks, the nudibranchs.

His wife, Olive Hornbrook MacFarland, was a superb scientific artist who executed most of the beautiful illustrations that illuminate the book. There are 72 quarto-size plates, 29 of them in color. The publication of this *Memoir* was made possible by a bequest from Mrs. MacFarland.

The *Occasional Papers* were produced entirely at the Academy and involved the work of Dorothy Ludlow, Maurice Giles, and Glenn Hayden. Several of the issues contained color plates made by or under the direction of Dr. and Mrs. G Dallas Hanna.

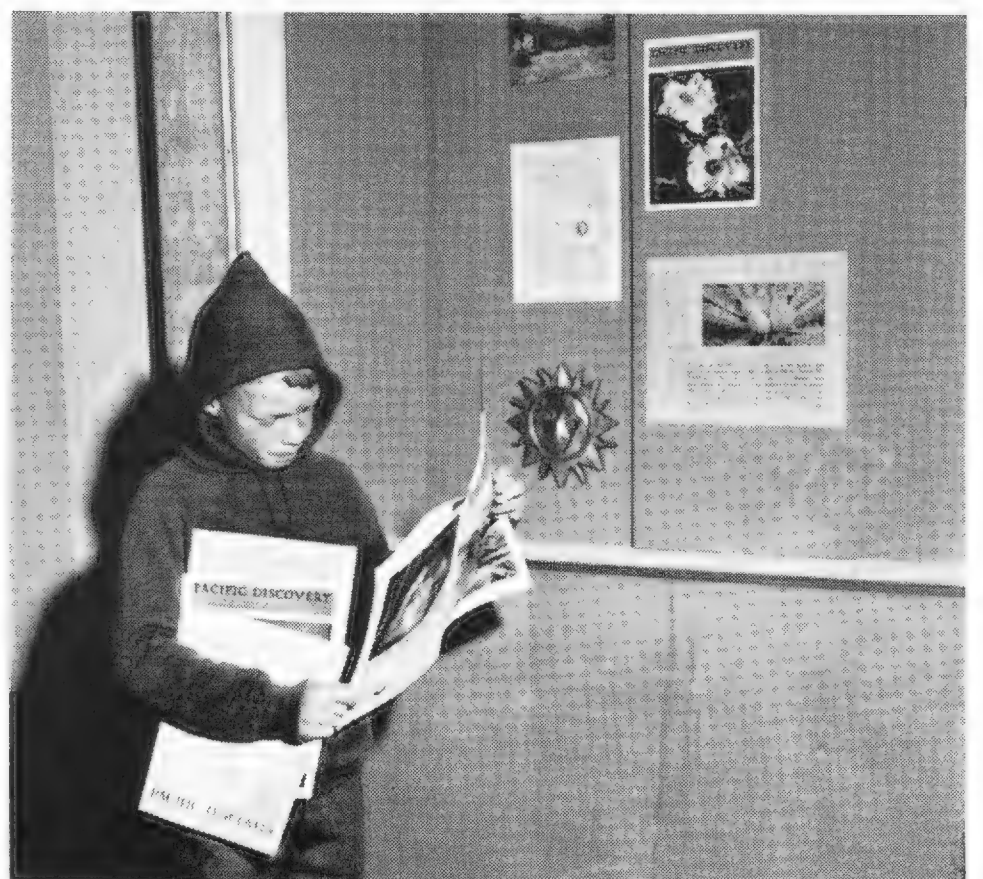
Miss Winifred O'Neill served as secretary for the Committee on Publications as well as chief proofreader. Dr. Leo G. Hertlein assisted Dr. Kessel in editing manuscripts.

PACIFIC DISCOVERY

Bruce Finson, Editor, and Johan Kooy, Art Director. The Academy's popular bimonthly magazine *Pacific Discovery* is distributed to all members as well as to non-member subscribers. More than 6500 copies of each number are printed.

Two special issues, one about Baja California and the other the Galápagos Islands, were particularly popular. Hal Richardson's fine page, "Academically Speaking," kept the members informed of facets of our complex organization. Also, every number carried articles by the Academy staff or about Academy activities. *Pacific Discovery* is not, however, a "house organ" but rather a quality magazine

Though directed to intelligent adults with interests in nature, "Pacific Discovery" frequently attracts young fans such as this lad with an armful of his favorite nature magazine.





The Academy receives a great deal of free publicity in newspapers and magazines, and notices that appear are collected in a press book, here being checked by Mary Stilwell.

directed to intelligent readers with interests in nature and man in the Pacific world.

In addition to Bruce Finson and Johan Kooy, the editorial board includes Robert C. Miller, Robert T. Orr, A. Starker Leopold, and George E. Lindsay. These men are responsible for editorial policy and the solicitation and selection of articles for each number. They devote many hours to reading and discussing manuscripts.

PUBLIC INFORMATION

Hal Richardson, Public Information Officer. Because of the many different kinds of activity that take place during the course of a year, the Academy often makes news and likewise it can be said that in a modest respect news can make the Academy. If our friends locally, nationally, and internationally were not apprised of what is going on, interest in what we are doing would not be sustained and it is quite possible that there would be a lessening of support. Therefore, it behooves us to publicize our new acquisitions, our exhibits, our planetarium shows, our meetings. This is Hal Richardson's responsibility.

Outside California, 31 states carried over 300 newspaper stories with the Academy featured. In San Francisco alone, 400 diverse bits of news concerning the CAS found their way into the major newspapers. The smaller neighborhood journals also continue faithfully in their support. It would be impossible to compute the total dollars of free air-time given by the 30 or so radio stations and five television stations announcing special events occurring in our complex in Golden Gate Park, but it easily approaches \$100,000 per year — a generous service for which we are enthusiastically grateful. Well-illustrated articles appeared in 12 miscellaneous magazines and though no credit line

was carried, a Cadillac advertisement (a photograph made in the forecourt) ran in practically every major magazine in the U. S. Giant-size cards appeared on the sides of the San Francisco municipal railway buses — another gratis service of local concerns.

Mr. Richardson writes and edits the *Academy Newsletter*, and contributes a column to *Pacific Discovery*. He also arranges the monthly membership meetings and is host, not only to the press, but to countless individuals and groups who visit the CAS annually.

Mrs. Walther Buchen and Miss Muriel French generously assisted Mr. Richardson as volunteers.

PICTURE COLLECTION

Johan Kooy, Chairman. The Picture Collection is the repository for photographic records and other graphic materials which pertain to the Academy or subjects within the realm of Academy interest. It houses, protects, and makes available the products of the life work of important photographers and artists. The Charles Webber collection of more than 40,000 photographs of natural history subjects; Toshio Asaeda's exquisite watercolor paintings of fishes made on the several Crocker Expeditions; and a



These shelves and cabinets contain thousands of photographic records and other graphic materials of natural history subjects. They are kept in order and good condition by Johan Kooy.

complete set of Henry Evans' block prints of botanical subjects are examples of the treasures it contains.

Activities of the Picture Collection during the past year concentrated on several continuing projects. Of primary importance was the organization of photographs resulting from early Academy expeditions and other early Academy activities. Previously housed in various depart-

ments, these photographs were brought together to be centrally cataloged, to facilitate their protection, and to make them more readily available for research and publication. Similarly, early gifts to the Academy of natural history photographs, prints, and original art works are being brought together in a uniform system of organization. These collections are a rich source of material for exhibit and publication and they record the changes in our natural environment during the past 100 years.

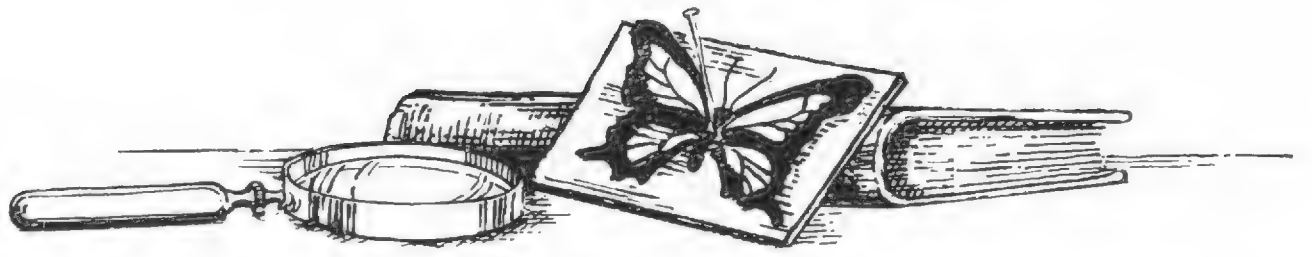
The department's largest and most widely used collection combines all the photographs, art works, and illustrations from various sources which are not specifically designated to be maintained separately. This pictorial reference collection has grown to include some 200,000 items. Associate Paul Anderson has been most generous in the great amount of time he has spent working with this collection and the gifts and financial support he has provided for it.

Other volunteers have given generously of their time. Associate Muriel French continued to work with transparencies of botanical subjects. Miss Lilian McHoul organized the Dennison Collection of Botanical Paintings. Mrs. Alan Mitchum and Mrs. Ray Philipson assisted in the work with the reference collection. Miss Lemoyne Mueller and Mrs. George Purmont gave special assistance during the year.

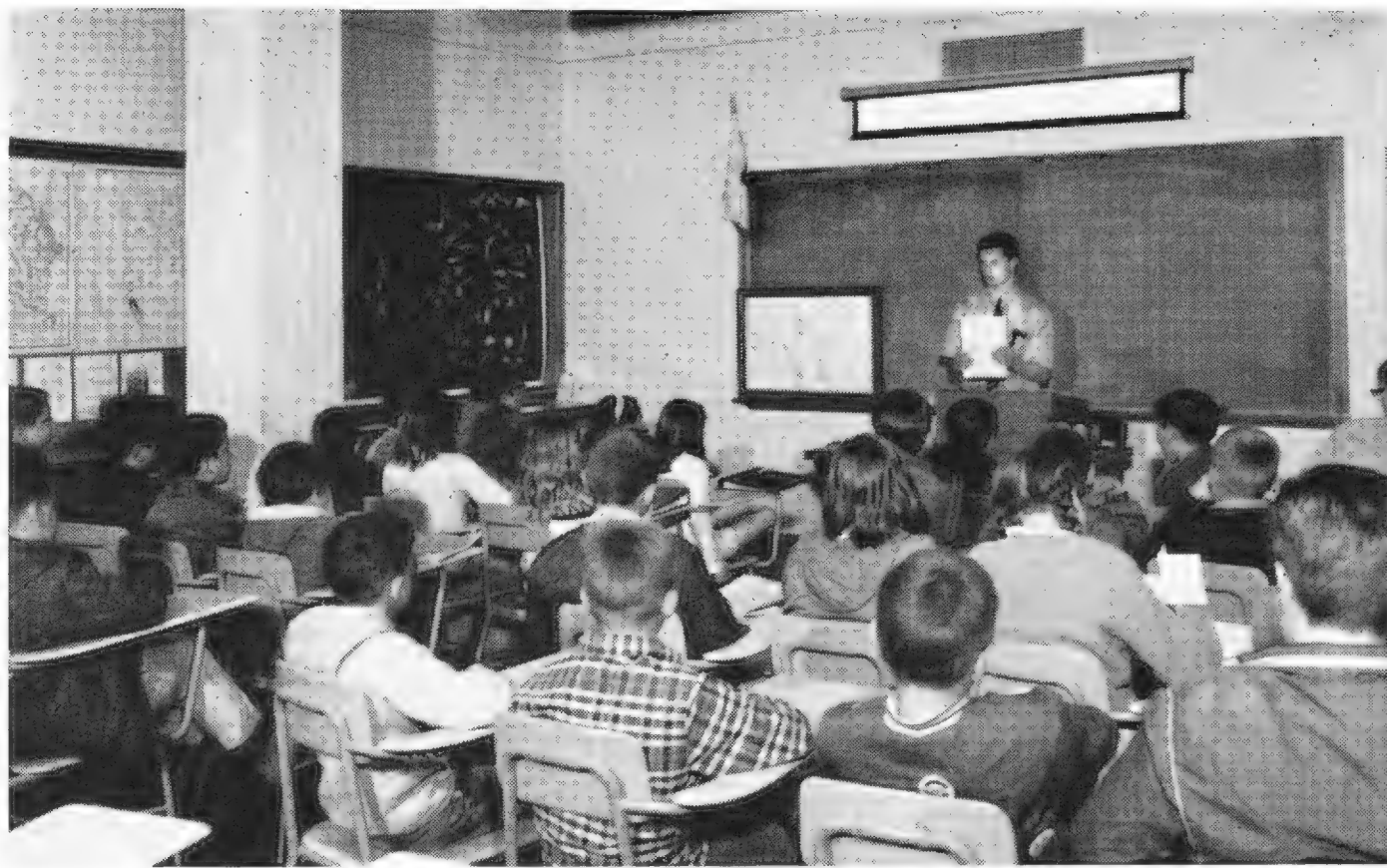
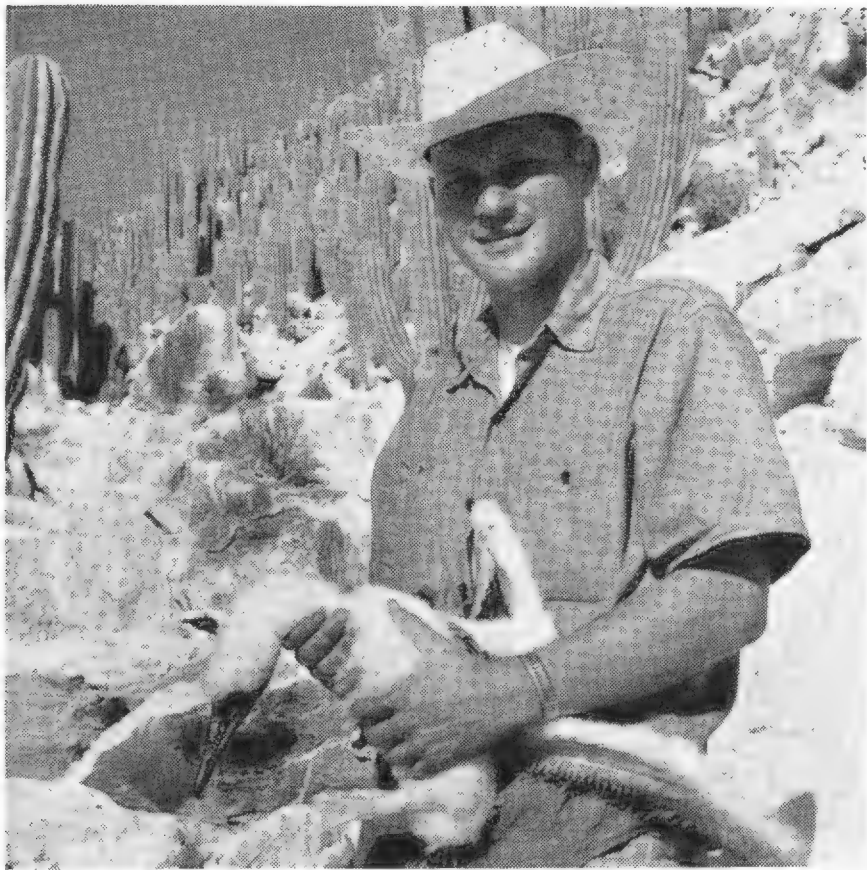
Gifts of particular note include the botanical paintings of Mrs. Mary V. Roberts, and the linoleum block prints of Mr. Henry Evans. The generous gift of Mrs. Somers Peterson made possible the purchase of some much-needed equipment for the picture collection. Near the end of the year Mr. Paul Anderson made a very significant financial contribution for the enlargement and improvement of the pictorial reference collection.

INSTRUMENT AND CARPENTER SHOPS

Alvin C. Gundred, Superintendent. The Instrument Shop, much of which was developed in order to build Morrison Planetarium's star projector, continues to provide otherwise unobtainable special instruments and equipment for the planetarium and other departments in the Academy. In fact, a planetarium technician is on duty in the shop during every planetarium show, night or day. Because of our unique facilities and talented personnel, the shop has constructed such specialized instruments as orrery projectors and Foucault pendulums for other scientific and educational institutions. During the past year pendulums were installed at Smith College in Massachusetts, Alpena Museum in Michigan, and the Salt Lake



Top, Bob Lathe machining the radius of a Foucault Pendulum ball in a mill. Three such pendulums were installed during the year. Above, Glenn Hayden printing a scientific publication.



The Junior Academy is headquarters for varied educational activities. Above, Supervisor Ken Lucas with a baby blue-footed booby on Isla San Pedro Martir. Above right, Instructor Darrel McKenzie lecturing to a class on the natural history of California, Summer 1966. Right, Kevin Morey caring for live animals. Far right, Bill Rogers preparing a study skin of a murre.



City Planetarium in Utah. No products which are available from commercial sources are provided to other institutions.

The Carpenter Shop makes the specimen cases for many of our scientific collections, and does the carpentry for new exhibit areas. Minor alterations, painting, and the maintenance of the general Academy plant are its additional responsibilities.

JUNIOR ACADEMY

Ken Lucas, Supervisor. Darrel McKenzie, Instructor. The California Junior Academy of Sciences is the official name of that very active department which was formerly called the "Student Section." This is in keeping with the nomenclature of the Academy Conference, a national organization within the framework of the American Association for the Advancement of Science.

Whatever the name, the Junior Academy is increasingly a center of interest for young scientists. There are now 210 members, divided almost evenly between the Juniors, age 10-14, and Seniors, 15-21. There is an active two-month summer program for the Juniors, with regular classes and field trips for all participants, and during the

school year there are lectures after school and on Saturday, with frequent field excursions. In the summer of 1965 the general subject of "Elementary Zoology" was explored, and from September through January the Saturday course was "Introduction to Evolution." From February through May "General Geology" was given. The subject for the summer of 1966 was "Natural History of California."

Members of the Senior group, those 15-21 years of age, meet from 1 until 5 in the afternoon and work on their special fields of interest. Group projects, such as a current study of the fauna of the Pinnacles National Monument, are encouraged. Many have curatorial responsibilities for the care of the collections of the various departments within the Junior Academy. Several have published papers in "Student Discovery," which is printed by the Junior Academy.

George E. Lindsay

GEORGE E. LINDSAY
Director

STAFF

George E. Lindsay, *Director*

Robert T. Orr, *Associate Director*

Earl S. Herald, *Associate Director for the Aquarium*

J. Byron Warner, *Business Manager* • Vashti F. Hawley, *Secretary*

Robert C. Miller, *Senior Scientist*

24 AQUATIC BIOLOGY (STEINHART AQUARIUM)

Earl S. Herald, *Superintendent-Curator*
Robert P. Dempster, *Assistant Superintendent*
Glenn E. Burghardt, *Assistant Curator*
Lloyd Gomez, *Aquatic Biologist*
Fred L. Jenne, *Aquatic Biologist*
William F. Rohrs, *Aquatic Biologist*
Karl H. Switak, *Aquatic Biologist (herpetologist)*
Norval J. Green, *Senior Aquarist*
Frederick W. Herms, *Aquarist*
Dennis Sullivan, *Aquarist*
W. Walter Schneebeli, *Aquatic Collector*
Willett J. Brown, *Aquarium Exhibits Preparator*
Donald A. Simpson, *Consultant (part-time)*
Phyllis J. Ensrud, *Secretary*
Fredric Frye, *Research Associate*
Marjorie Hunt, *Research Associate*
John Mizelle, *Research Associate*
Ben W. Papermaster, *Research Associate*
J. Richard Skahen, *Research Associate*

ASTRONOMY (MORRISON PLANETARIUM)

Thomas M. Gates, *Chairman and Manager*
Michael A. Bennett, *Staff Lecturer*
Steven B. Craig, *Chief Technician*
John H. Leonberger, *Technician*
Lysbeth Fritz, *Secretary*
Maurice R. Amsden, *Lecturer*
Hubert J. Bernhard, *Lecturer*
Allwyn Chao, *Lecturer*
Charles F. Hagar, *Lecturer*
Harry G. Jorgensen, *Lecturer*
Harold Rolph, *Lecturer*
David W. Todd, Jr., *Instructor*
Thomas McDonough, *Projectionist*
Chance Massaro, *Projectionist*
Jill Carson, *Cashier*
Peggy Kerwin, *Cashier*
Gloria Thompson, *Cashier*
Ronald Daher, *Usher*
Clifford Louie, *Usher*
Agusto Ng, *Usher*
Gary Rowan, *Usher*
Scott Schiechl, *Usher*
Clay P. Butler, *Research Associate*
Samuel J. Klenk, *Custodian*

BOTANY

John Thomas Howell, *Chairman and Curator*
Elizabeth McClintock, *Associate Curator*
Virginia Moore, *Technical Assistant (part-time)*
Blanche Clear, *Assistant (part-time)*
Anita Noldeke, *Assistant (part-time)*
Sallie Norwall, *Assistant (part-time)*
Luis Baptista, *Herbarium Assistant (part-time)*
Doris Cantou, *Bibliographer (part-time)**
Philip Wheeler, *Assistant (part-time)**
Mrs. Clare B. Hardham, *Research Associate*

Robert F. Hoover, *Research Associate*
Hans Leschke, *Research Associate*
Henry M. Pollard, *Research Associate*
Lewis S. Rose, *Research Associate*
Gordon H. True, *Research Associate*
Ernest C. Twisselmann, *Research Associate*
Ira L. Wiggins, *Research Associate*
Beatrice E. Howitt, *Field Associate*

*Temporary position supported by
the Bailey Hortorium grant

ENTOMOLOGY

Edward S. Ross, *Chairman and Curator*
Edward L. Kessel, *Associate Curator*
Hugh B. Leech, *Associate Curator*
Paul H. Arnaud, Jr., *Assistant Curator*
John W. Green, *Scientific Assistant*
David Cavagnaro, *Technician***
Thomas W. Davies, *Technician (part-time)*
Stella E. Tatro, *Secretary*
Harriet E. Frizzell, *Research Associate*
J. Linsley Gressitt, *Research Associate*
Hartford H. Keifer, *Research Associate*
E. Gorton Linsley, *Research Associate*
Robert L. Usinger, *Research Associate*
Joseph Wilcox, *Research Associate*
Francis X. Williams, *Research Associate*
Chris Parrish, *Field Associate*

**Temporary position supported by a
National Science Foundation grant

EXHIBITS

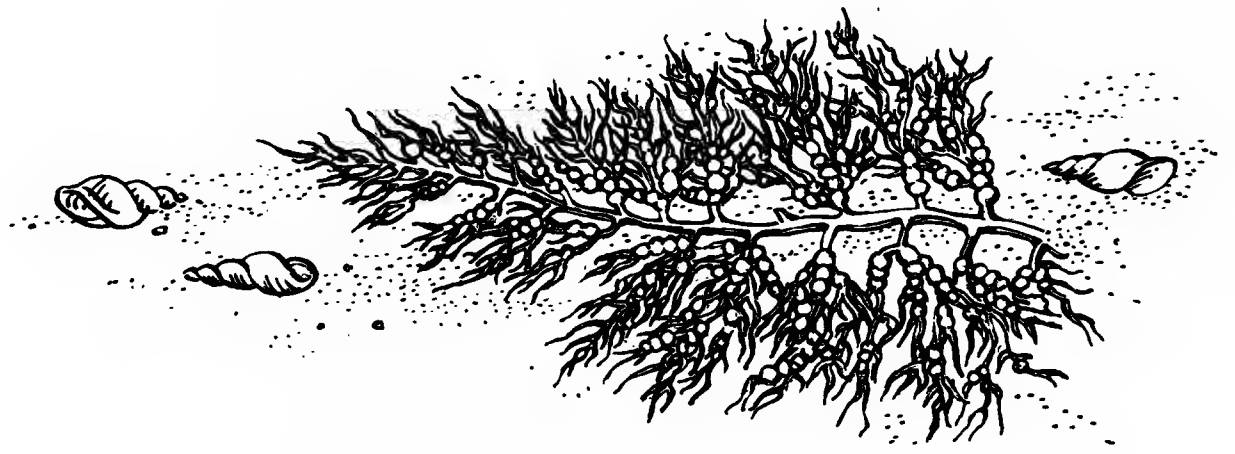
Mearl F. Carson, *Chairman and Curator*
Timothy J. O'Leary, *Assistant Curator*
Charles E. Dornbach, *Senior Assistant*
Gary Guiliani, *Assistant*
Jean Pitts, *Assistant*
Ansel E. Adams, *Research Associate*

GEOLOGY

G Dallas Hanna, *Chairman and Curator*
Leo G. Hertlein, *Curator of Invertebrate Paleontology*
Dorothy M. Ludlow, *Secretary (part-time)*
Winifred O'Neill, *Secretary (part-time)*
A. L. Brigger, *Research Associate*
Charles W. Chesterman,
Research Associate and Honorary Curator of Minerals
Clifford C. Church, *Research Associate*
Alan J. Galloway, *Research Associate*

HERPETOLOGY

Alan E. Leviton, *Chairman and Curator*
Steven C. Anderson, *Assistant Curator*
Charlotte H. Dorsey, *Secretary (part-time)*
Benjamin H. Banta, *Research Associate*
James R. Dixon, *Research Associate*
Benjamin W. Grunbaum, *Research Associate*
David O. Jameson, *Research Associate*
Malcolm R. Miller, *Research Associate*
George S. Myers, *Research Associate*



Lawrence S. Swan, *Research Associate*
John Gasperetti, *Field Associate*

HOROLOGY

Bruce A. Kock, *Honorary Curator*

ICHTHYOLOGY

W. I. Follett, *Chairman and Curator*
Lillian J. Dempster, *Associate Curator*
John D. Hopkirk, *Curatorial Assistant (part-time)*
Carl L. Hubbs, *Research Associate*

INSTRUMENT AND CARPENTER SHOP

Alvin C. Gundred, *Superintendent*
A. S. Getten, *Instrument Designer*
Frank M. Talbert, *Machinist*
Peter P. Tebneff, *Chief Installer*
Konstantin Kurkin, *Cabinetmaker*
Uldarico Gontenas, *Assistant Cabinetmaker*
Frank Ramirez, *Assistant Electrician*

INVERTEBRATE ZOOLOGY

Allyn G. Smith, *Chairman and Associate Curator*
Robert C. Miller, *Curator*
Charles R. Stasek, *Assistant Curator****
Dustin D. Chivers, *Technical Assistant****
Kathleen Kamiya, *Technical Assistant****
Ludmeila Axionoff, *Clerical Assistant*
Francis P. Filice, *Research Associate*
Joel W. Hedgpeth, *Research Associate*
A. Myra Keen, *Research Associate*
Robert T. Talmadge, *Field Associate*

***Temporary position supported by a
National Science Foundation grant

LIBRARY

Ray Brian, *Librarian*
Margaret T. Cairns, *Assistant Librarian*
Nancy Haritatos, *Assistant Librarian (part-time)*
Miriam Barnett, *Library Assistant (part-time)*
Mary Stilwell, *Library Assistant*
Julian Arntz, *Library Associate*
Dolores Cadell, *Library Associate*
Margaret W. Campbell, *Library Associate*
Jeanette Hopkins, *Library Associate*
Anson Herrick, *Library Associate*
Florence Walter, *Library Associate*

MAINTENANCE AND OPERATING

William L. Denevi, *Chief Stationary Engineer*
George F. Murphy, *Senior Stationary Engineer*
Herbert Banister, *Stationary Engineer*
Andrew J. Bell, *Stationary Engineer*
Ralph Clemens, *Stationary Engineer*
John V. Daley, *Stationary Engineer*
John E. Weaver, *Stationary Engineer*
John T. Phillips, *Museum Guard*
Frank Rogers, *Museum Guard*
Joseph A. Gomez, *Janitor Sub-foreman*
Rachel Worthery
Louis M. Blakely

Nathan C. Cole
Bernard Conlon
James Jackson, Jr.
Eugenio Luis
Clenny J. Thierry

OFFICE

Paul G. Brislawn, *Accountant*
Elizabeth C. Drake, *Stenographer*
Marian Ganapol, *Membership Secretary (part-time)*
Dorothy N. Lohmeyer, *PBX Receptionist*
Olive T. Lucich, *Assistant Bookkeeper*

ORNITHOLOGY AND MAMMALOLOGY

Robert T. Orr, *Chairman and Curator*
Jacqueline Schonewald, *Technical Assistant*
Charlotte H. Dorsey, *Secretary (part-time)*
Robert I. Bowman, *Research Associate*
Anatole S. Loukashkin, *Research Associate*
Dorcas E. MacClintock, *Research Associate*
J. Stuart Rowley, *Research Associate*
Walter A. Sheppe, *Research Associate*
J. Dan Webster, *Research Associate*
Raymond Bandar, *Field Associate*

PACIFIC DISCOVERY

Bruce Finson, *Editor*
Johan Kooy, *Art Director*

PHOTOGRAPHY

Maurice C. Giles

PICTURE COLLECTION

Johan C. Kooy, *Chairman*
Paul Anderson, *Associate*
Muriel French, *Associate*

PUBLIC INFORMATION

Hal Richardson

SALES — INFORMATION

Edna Abbott
Ruth T. Bush
Rowena E. Darch
Helena Herrington
Gladys A. Hughes
Lilian I. Grainger
Marion S. Kellogg
Marion Mortenson
Fay Read
Greta Traub
Irene S. Williams

SCIENTIFIC PUBLICATIONS

Edward L. Kessel, *Editor*
Winifred S. O'Neill, *Editorial Assistant*
Dorothy M. Ludlow, *Secretary (part-time)*
Glen S. Hayden

JUNIOR ACADEMY

Ken Lucas, *Supervisor*
Darrel McKenzie, *Instructor (part-time)*

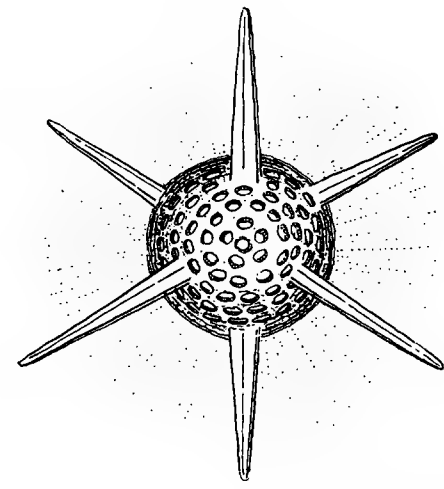
STAFF PUBLICATIONS

"A research project once begun must be brought to publication, or, through procrastination, a man's life and the resources which have supported his studies will have been wasted. Accomplishment in research is judged in publication, though of course the number of titles is no measure of productivity nor the quality of work."

Robert T. Hatt, Director
Cranbrook Institute of Science

26

- ANDERSON, STEVEN C., RICHARD J. CLARK and ERICA CLARK
(See: Clark, Richard J., *et al.*)
- ANDERSON, STEVEN C., and ALAN E. LEVITON
1966 A new species of *Eublepharis* from southwestern Iran (Reptilia: Gekkonidae). Occ. Pap. California Acad. Sci., no. 53, 5 pp., 2 figs.
(See also: Leviton, Alan E., and Steven C. Anderson)
- ARNAUD, PAUL H.
1966 A revision of the parasitic fly genus *Polistiopsis* Townsend (Diptera, Tachinidae). American Mus. Novit., no. 2241, 12 pp., 20 figs.
— Correspondence files of Dr. A. L. Melander. Pan-Pacific Ento., vol. 42, p. 73.
- ARNAUD, PAUL H., and DAVID C. RENTZ
1965 *Ceracia dentata*, a parasite of *Chimarocephala pacifica* in California (Diptera: Tachinidae and Orthoptera: Acrididae). Pan-Pacific Ento., vol. 41, pp. 204-206, 1 fig.
- ARNAUD, PAUL H., and CURTIS W. SABROSKY
(See: Sabrosky, Curtis, W., and Paul H. Arnaud)
- BRIGGER, A. L., and G. DALLAS HANNA
(See: Hanna, G. Dallas, and A. L. Brigger)
- CARR, J. L., and HUGH B. LEECH
1966 The rediscovery of *Agabus audeni* Wallis, and a note on *Agabus coxalis* Sharp (Coleoptera: Dytiscidae). Canadian Ento., vol. 98, pp. 544-550, 18 figs.
- CHAPMAN, DOUGLAS G., and GARTH I. MURPHY
1965 Estimates of mortality and population from survey-removal records. Biometrics, vol. 21, pp. 921-935.
- CLARK, RICHARD J., ERICA CLARK and STEVEN C. ANDERSON
1966 Report on two small collections of reptiles from Iran. Occ. Pap. California Acad. Sci., no. 55, 9 pp.
- COWAN, IAN MCT., and ALLYN G. SMITH
(See: Smith, Allyn G., and Ian MCT. Cowan)
- DEMPSTER, LILLIAN J., and W. I. FOLLETT
(See: Follett, W. I., and Lillian J. Dempster)
- DEMPSTER, ROBERT P.
1966 Food requirements for captive animals commonly displayed at Steinhart Aquarium. International Zoo Yearbook, vol. 6 (1965), 1 p.
- DEMPSTER, ROBERT P., and EARL S. HERALD
(See: Herald, Earl S., and Robert P. Dempster)
- DIXON, JAMES R.
1966 Speciation and systematics of the gekkonid lizard genus *Phyllodactylus* of the islands of the Gulf of California. Proc. California Acad. Sci., ser. 4, vol. 33, pp. 415-452.
- FOLLETT, W. I.
1965 Fish remains from Deer Creek Cave, Elko County, Nevada. Nevada State Mus., Anthro. Pap., no. 11, 3 pp.
— [Index of the journal Copeia, for the year 1965.] Copeia, 1965, pp. 546-567.
1966 Man-eater of the California coast. Pacific Discovery, vol. 19, no. 1, pp. 18-22, 10 figs.
— Fish remains in the archeological context. In: Symposium on central California archeology: problems, programs, and interdisciplinary approaches. Sacramento Anthro. Soc., Paper 3, pp. 36-46, pls. 1-5.
— Fish remains from the Conejo Rock Shelter Site (Ven-69), Ventura County, California. Dept. Anthro., Univ. California, Los Angeles, Archeological Survey Ann. Rept., 1965, pp. 81-90, 1 pl.
- FOLLETT, W. I., and LILLIAN J. DEMPSTER
1965 Ichthyological and herpetological names and works on which the International Commission on Zoological Nomenclature has ruled since the publication (in 1958) of the several Official Lists and Indexes. Copeia, 1965, pp. 518-523.
- FOLLETT, W. I., and ROBERT L. USINGER
(See: Usinger, Robert L., and W. I. Follett)
- HANNA, G. DALLAS
1965 [Letters quoted] In: Mitchell, Edward. History of research at Sharktooth Hill, Kern County, California. Spec. Publ. Kern Co. Historical Soc. & County of Kern through its Mus., pp. 5-7.
1966 Introduced mollusks of western North America. Occ. Pap. California Acad. Sci., no. 48, 108 pp., 4 pls., 85 text-figs.
— Preface. In: MacFarland, Frank Mace. Studies of opisthobranchiate mollusks of the Pacific coast of North America. Mem. California Acad. Sci., vol. 6, pp. vii-viii.
- HANNA, G. DALLAS, and A. L. BRIGGER
1965 A review of *Kittonia*, a genus of diatoms. Occ. Pap. California Acad. Sci., no. 50, 10 pp., 18 figs.
- HERALD, EARL S.
1965 Studies on the Atlantic American pipefishes with descriptions of new species. Proc. California Acad. Sci., ser. 4, vol. 32, pp. 363-375.
- HERALD, EARL S., and ROBERT P. DEMPSTER
1965 Brine shrimp vs. copper solutions. Aquarium Jour., vol. 36, pp. 334-336.
- HERTLEIN, LEO G.
1965 [Review of] Antarctic and Subantarctic Mollusca: Amphineura, Scaphopoda and Bivalvia, by R. K. Dell. Veliger, vol. 8, pp. 43-44.
1966 [Review of] A revision of F. W. Hutton's pelecypod species described in the catalogue of Tertiary Mollusca and Echinodermata (1873), by A. U. E. Boreham (Mrs. H. G. Scott). Veliger, vol. 8, p. 204.
— [Checklist of Miocene marine invertebrates.] In: Bowen, O. E., Stratigraphy, structure and oil possibilities in Monterey and Salinas quadrangles, California. Symposium Pap. 40th Ann. Pacific Sect. A. A. P. G. Convention — 1965, Bakersfield, pp. 52, 56, 58, 59, 63, 65.
- HOWELL, JOHN THOMAS
1965 Notes on *Oxytheca*. Leaflet. West. Bot., vol. 10, p. 180.
— A new Sierran *Streptanthus*. Leaflet. West. Bot., vol. 10, pp. 182, 183.
— *Tolpis* in California. Leaflet. West. Bot., vol. 10, p. 188.
— Gazetteer of Marcus E. Jones' botanical exploration. Leaflet. West. Bot., vol. 10, pp. 229-236.
1966 *Viscum album* in California. Leaflet. West. Bot., vol. 10, p. 244.
— *Cuscuta nevadensis* in California. Leaflet. West. Bot., vol. 10, p. 250.
— A new *Potentilla* from the Sierra Nevada, California. Leaflet. West. Bot., vol. 10, pp. 254, 255.
— *Amaranthus arenicola* in Monterey County, California. Leaflet. West. Bot., vol. 10, p. 256.
— Notes on *Gaultheria* in California. Leaflet. West. Bot., vol. 10, pp. 270-272.
— *Lorus pedunculatus* in the Pacific States. Leaflet. West. Bot., vol. 10, pp. 272, 273.
- HOWELL, JOHN THOMAS, and GORDON H. TRUE, Jr.
1966 Interesting plants from Nevada County, California. Leaflet. West. Bot., vol. 10, pp. 274-278.
- KESSEL, EDWARD L.
1965 Family Platypezidae. In: Stone, *et al.*, A Catalog of the Diptera of America north of Mexico. United States Dept. Agri. Handbook No. 276, pp. 546-550.
— *Lindneromyia*, a new genus of flat-footed flies, and the descriptions of two new species of Platypezidae from Africa (Diptera). Stuttgarter Beitr. Naturk., Nr. 143, pp. 1-6.
— *Microsania* as prey for *Hormopeza* (Diptera: Platypezidae and Empididae). Wasmann Jour. Biol., vol. 23, pp. 225-226.
— *Symmetricella*, a new genus of Platypezidae from Peru (Diptera). Wasmann Jour. Biol., vol. 23, pp. 235-239.
1966 New species of *Platypeza* and *Callomyia* (Family Platypezidae). In: Diptera from Nepal. Bull. British Mus. (Nat. Hist.), Ento., vol. 17, pp. 453-455.
- LEECH, HUGH B.
1965 [Book notice] The ground-beetles . . . of Canada and Alaska. Part 3. By Carl H. Lindroth. Pan-Pacific Ento., vol. 42, p. 24.
— [Book notice] The Cerambycidae of North America, Parts IV & V. By E. G. Linsley. Pan-Pacific Ento., vol. 41, p. 113.
- LEECH, HUGH B., and J. L. CARR
(See: Carr, J. L., and Hugh B. Leech)
- LEVITON, ALAN E.
1965 Contributions to a review of Philippine snakes, VII. The snakes of the genera *Naja* and *Ophiophagus*. Philippine Jour. Sci., vol. 93, pp. 531-550, 1 fig.
— Contributions to a review of Philippine snakes, VIII. The snakes of the genus *Lycodon* H. Boie. Philippine Jour. Sci., vol. 94, pp. 119-140, 1 fig.
- LEVITON, ALAN E., and STEVEN C. ANDERSON
1966 Further comment on the behavior of the Panamanian microteiid *Echinosauro horrida*. Herpetologica, vol. 22, p. 160.
(See also: Anderson, Steven C., and Alan E. Leviton)
- LINDSAY, GEORGE E.
1965 Annual report of the director, California Academy of Sciences, 1964-1965. California Acad. Sci., San Francisco, 33 pp.
— The mission period of Baja California. Pacific Discovery, vol. 18, no. 4, pp. 2-8, 14 figs.



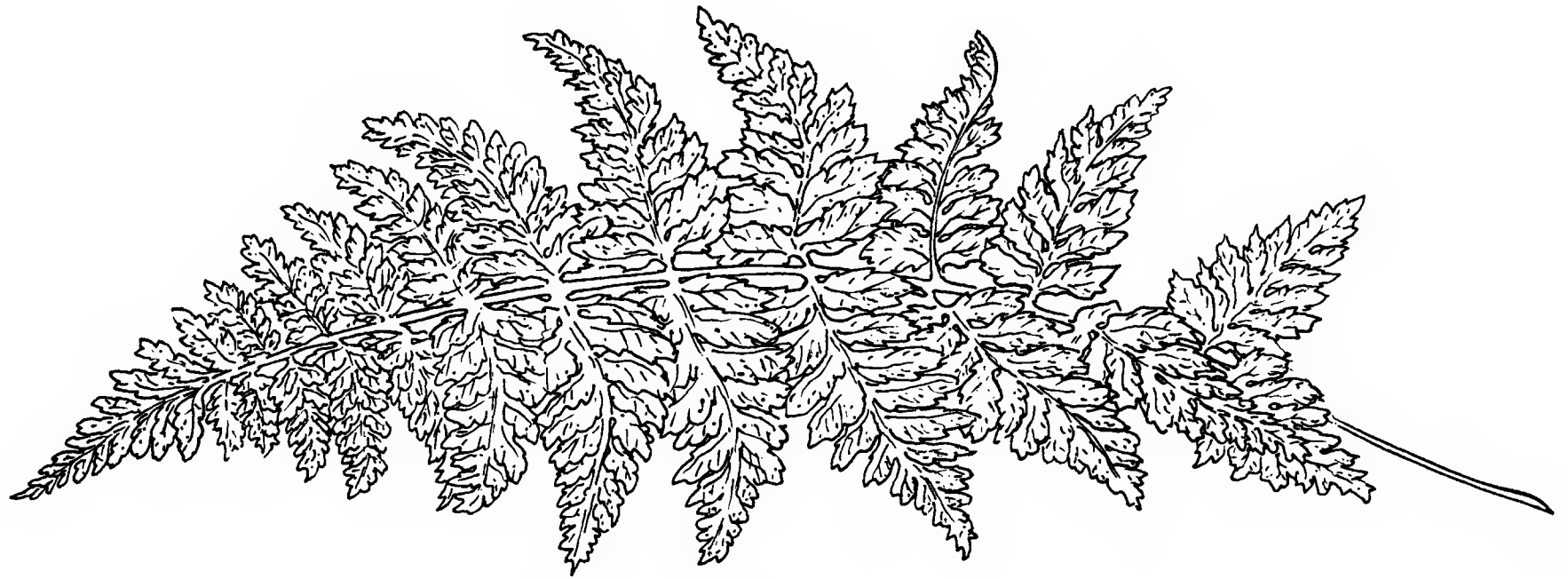
- Desert plants of Baja California. *Pacific Discovery*, vol. 18, no. 4, pp. 15-20, 12 figs.
- [Review of] Lower California guidebook, by Peter Gerhard and Howard E. Gulick. *Pacific Discovery*, vol. 18, no. 4, p. 33.
- A fossil hunt. *Pacific Discovery*, vol. 18, no. 6, pp. 18-24, 13 figs.
- [Review of] The animal kingdom, by Robert T. Orr. *Pacific Discovery*, vol. 18, no. 6, p. 31.
- Los Ferocacti de Baja California. *Cactaceas y Succulentas Mexicanas*, vol. 10, pp. 76-91.
- 1966 [Review of] Wandering through winter, by Edwin Way Teale. *Pacific Discovery*, vol. 19, no. 1, p. 32.
- [Review of] New England and the south seas, by Ernest S. Dodge. *Pacific Discovery*, vol. 19, no. 2, p. 31.
- [Review of] Island life: a natural history of the islands of the world, by Sherwin Carlquist. *Pacific Discovery*, vol. 19, no. 2, p. 31.
- Guadalupe Island. *Pacific Discovery*, vol. 19, no. 3, pp. 2-11, 21 figs.
- McCLINTOCK, ELIZABETH
- 1965 The African yew-tree in California. *Jour. California Horticultural Soc.*, vol. 26, pp. 66-67.
- The herbarium and horticulture. *Jour. California Horticultural Soc.*, vol. 26, pp. 97-101.
- Podocarps in the Strybing Arboretum. *Notes Strybing Arboretum*, vol. 3, pp. 27-30.
- Plant notes [discussed at monthly meetings of the California Horticultural Society]. *Bull. California Horticultural Soc.*, Aug. to Nov. [monthly].
- 1966 Plant notes [discussed at monthly meetings of the California Horticultural Society]. *Bull. California Horticultural Soc.*, Jan. to June [monthly].
- MILLER, MALCOLM R.
- 1966 The cochlear duct of lizards. *Proc. California Acad. Sci.*, ser. 4, vol. 93, pp. 255-359, 23 pls.
- MILLER, ROBERT C.
- 1965 Islands of the tortoise. *Pacific Discovery*, vol. 18, no. 5, pp. 1-2.
- [Review of] The lives of desert animals in Joshua Tree National Monument, by Alden H. Miller and Robert C. Stebbins. *Pacific Discovery*, vol. 18, no. 6, p. 31.
- [Review of] Ne Plus Ulcers: Views from an Ivory Tower, by R. M. Winger. *Pacific Discovery*, vol. 18, no. 6, p. 31.
- 1966 America the beautiful — can we save it? *Pacific Discovery*, vol. 19, no. 1, p. 1.
- Preface. In: Guthrie, Esther L. Home book of animal care. New York (Harper & Row), pp. vii-viii.
- Foreword. In: Felton, Ernest L. California's many climates. Palo Alto (Pacific Books), p. v.
- Frank Mace MacFarland (1869-1951). In: MacFarland, Frank Mace. Studies of Opisthobranchiate Mollusca of the Pacific Coast of North America. *Mem. California Acad. Sci.*, vol. 6, pp. xi-xiv.
- MURPHY, GARTH I.
- 1965 A solution of the catch equation. *Jour. Fish. Res. Bd. Canada*, vol. 22, pp. 191-202.
- Living resources off our shores. *California Mag. Commerce, Agriculture and Industry*, December, 3 pp.
- [Review of] Ocean Sciences, edited by E. J. Long. *Trans. American Fish. Soc.*, vol. 94, p. 281.
- 1966 Population biology of the Pacific sardine (*Sardinops caerulea*). *Proc. California Acad. Sci.*, ser. 4, vol. 34, pp. 1-84, 17 text-figs.
- MURPHY, GARTH I., and DOUGLAS G. CHAPMAN
(See: Chapman, Douglas G., and Garth I. Murphy)
- ORR, ROBERT T.
- 1965 Interspecific behavior among pinnipeds. *Zeitschrift Säugetierkunde*, vol. 30, pp. 163-171.
- An expedition to the Sea of Cortez. *Pacific Discovery*, vol. 18, no. 4, pp. 9-14, 10 figs.
- Barrington Island. *California Monthly*, vol. 75, no. 10, pp. 18-20.
- Barrington Island. *Pacific Discovery*, vol. 18, no. 5, pp. 23-27, 10 figs.
- Longevity in *Pizonyx vivax*. *Jour. Mamm.*, vol. 46, p. 497.
- [Review of] Cats of the world, by Armand Dennis. *Pacific Discovery*, vol. 18, no. 6, p. 31.
- 1966 [Review of] Black brant, by Arthur S. Einarsen. *Pacific Discovery*, vol. 19, no. 1, p. 32.
- [Review of] Mammals of the Pacific states, by Lloyd G. Ingles. *Pacific Discovery*, vol. 19, no. 1, p. 32.
- Guitarfish. Nature photography: XVIII. *Pacific Discovery*, vol. 19, no. 2, pp. 16-17, 1 fig.
- [Review of] The giant Canada goose, by Harold C. Hanson. *Pacific Discovery*, vol. 19, no. 2, p. 31.
- Cuvier's beaked whale in the Gulf of California. *Jour. Mamm.*, vol. 47, p. 399.
- Risso's dolphin on the Pacific coast of North America. *Jour. Mamm.*, vol. 47, pp. 341-343.
- [Review of] Whales, dolphins, and porpoises, edited by Kenneth S. Norris. *Science*, vol. 152, p. 1613.
- ORR, ROBERT T., and THOMAS C. POULTER
- 1965 The pinniped population of Año Nuevo Island, California. *Proc. California Acad. Sci.*, ser. 4, vol. 32, pp. 377-404, 12 figs.
- ORR, ROBERT T., and J. STUART ROWLEY
(See: Rowley, J. Stuart, and Robert T. Orr)
- PARRISH, CHRIS
- 1966 The biology of scorpions. *Pacific Discovery*, vol. 19, no. 2, pp. 2-11, 25 figs.
- POULTER, THOMAS C., and ROBERT T. ORR
(See: Orr, Robert T., and Thomas C. Poulter)
- POWELL, DAVID H.
- 1966 Notes on keeping the giant red nudibranch (*Dendronotus iris*). *International Zoo Yearbook*, vol. 6 (1965), 1 p.
- RENTZ, DAVID C., and HUGH B. LEECH
(See: Leech, Hugh B., and David C. Rentz)
- ROSS, EDWARD S.
- 1965 Asian Insects in Disguise. *National Geographic*, vol. 128, pp. 432-439.
- 1966 The Embioptera of Europe and the Mediterranean region. *Bull. British Mus. (Nat. Hist.)*, Entom., vol. 17, pp. 275-326, 20 figs.
- Brave mantid. Nature photography: XIX. *Pacific Discovery*, vol. 19, no. 3, pp. 16-17, 1 fig.
- ROWLEY, J. STUART, and ROBERT T. ORR
- 1965 Nesting and feeding habits of the white-collared swift. *Condor*, vol. 67, pp. 449-456.
- RUBTZOFF, PETER
- 1965 Notes on fresh-water marsh and aquatic plants in California — IV. *Leaf. West. Bot.*, vol. 10, pp. 164-168.
- 1966 Notes on fresh-water marsh and aquatic plants in California — V. *Leaf. West. Bot.*, vol. 10, pp. 265-269.
- SABROSKY, CURTIS W., and PAUL H. ARNAUD
- 1965 Family Tachinidae (Larvaevoridae). In: Stone, *et al.*, A catalog of the Diptera of America north of Mexico. United States Dept. Agri. Handbook, no. 276, pp. 961-1108.
- SHEPPE, WALTER
- 1965 Dispersal by swimming in *Peromyscus leucopus*. *Jour. Mamm.*, vol. 46, pp. 336-337.
- Periodontal disease in the deer mouse, *Peromyscus*. *Jour. Dental Res.*, vol. 44, pp. 506-508.
- Characteristics and use of *Peromyscus* tracking data. *Ecology*, vol. 46, pp. 630-634.
- Unseasonal breeding in artificial colonies of *Peromyscus leucopus*. *Jour. Mamm.*, vol. 46, pp. 641-646.
- SMITH, ALLYN G.
- 1965 The Galapagos International Scientific Project. *Pacific Discovery*, vol. 18, no. 5, pp. 7-9, 6 figs.
- SMITH, ALLYN G., and IAN McT. COWAN
- 1966 A new deep-water chiton from the northeastern Pacific. *Occ. Pap. California Acad. Sci.*, no. 56, 15 pp.
- STASEK, CHARLES R.
- 1965 Behavioral adaptation of the giant clam *Tridacna maxima* to the presence of grazing fishes. *Veliger*, vol. 8, pp. 29-35a.
- 1966 Type specimens in the California Academy of Sciences, Dept. Invertebrate Zoology. *Occ. Pap. California Acad. Sci.*, no. 51, 38 pp.
- Harold Heath's type solenogasters (Mollusca, Amphineura, Aplacophora) in the California Academy of Sciences, Department of Invertebrate Zoology. *Occ. Pap. California Acad. Sci.*, no. 52, 7 pp.
- SWITAK, KARL H.
- 1966 Nutrition and care of the Madagascar day gecko (*Phelsuma madagascariensis*). *International Zoo Yearbook*, vol. 6 (1965), 1 p.
- What you don't know about rattlesnakes may kill you. *Peninsula Living*, May 8, pp. 15, 40.
- TRUE, GORDON H., Jr., and JOHN THOMAS HOWELL
(See: Howell, John Thomas, and Gordon H. True, Jr.)
- USINGER, ROLBERT L., and W. I. FOLLETT
- 1966 Copyright bill: taxonomic works. *Science*, vol. 152, pp. 291-292.

OUR SINCERE GRATITUDE IS EXTENDED TO...

Many business organizations, foundations and special funds made donations or grants during the past 12 months to help support and carry forward the Academy's scientific research and educational programs. This support has enabled the Academy to continue its basic work. For their assistance we are indeed most grateful and express our sincere thanks. Among those who have supported the Academy in this manner during the past 12 months are:

28

Acme Foundation	Dodge & Cox
Allyne (Estate of Edith W.)	Dow Chemical Company
American Association for the Advancement of Science	Eastman Kodak Company
American Can Company	First Western Bank and Trust Company
American Potash & Chemical Corporation	FMC Foundation
Argonaut Underwriters, Inc.	Friden, Inc.
Atkinson (Guy F.) Company	Fromm & Sichel, Inc.
Atomic Energy Commission	General Electric Company
Bank of America, N.T. & S.A.	General Steamship Corporation, Ltd.
Bank of California, N.A.	George Lithograph Company
Basic Vegetable Products, Inc.	Guittard Chocolate Co.
Bechtel Corporation	Haas Brothers
Belvedere Scientific Fund	Healy-Tibbitts Construction Company
Bissinger & Co.	Hewlett-Packard Company
Bullard (E. D.) Company	Hilp (Harry H.) Foundation
Burke (Frederic) Foundation for Education	Hindes (Barrett and Margaret) Foundation
Calaveras Cement Company	Hock Investment Company, Inc.
California and Hawaiian Sugar Refining Corporation, Ltd.	Industrial Indemnity Company
California Packing Corporation	Insurance Securities Incorporated
California-Western States Life Insurance Company	Irwin (The William G.) Charity Foundation
Cerro Copper & Brass Company	Johnson (Reynold C.) Company
City Transfer and Storage Company	Kaiser Industries Corporation
Coffee (Stephen R.) Trust	Kendrick (Charles Warren) Memorial Fund
Coldwell, Banker & Company	KLC Foundation
Continental Can Company, Inc.	Lane Publishing Company
Cravens-Dargan and Company	Lawrence Warehouse Company
Crocker (H. S.) Co., Inc.	Layton (Alfred B.) Fund
Crocker-Citizens National Bank	Lenkurt Electric Co., Inc.
Crocker (The Mary A.) Trust	Lerner (Syril) Foundation
Crown Zellerbach Foundation	Lyman (Maud E.) Memorial Fund
Deere (John) Company	MacFarland (Estate of Olive H.)
	Mailliard & Schmiedell



McBean (The Atholl) Foundation
McCarthy (John A.) Foundation
Menzies (Estate of R. H.)
Meyer (Wilson & George) & Co.
Morrison-Knudsen Company, Inc.
Muhs (Fred R.) Family Foundation
National Science Foundation
Nelson (James A.) Co., Inc.
Oakes (Roscoe and Margaret) Foundation
Pacific Coast Engineering Company
Pacific Far East Line, Inc.
Pacific Gas and Electric Company
Pacific National Bank of San Francisco
Pacific Telephone and Telegraph Company
Paine, Webber, Jackson & Curtis
Parrish & Maxwell
Parrott & Co.
Penney (L. H.) & Co.
Phoenix Iron Works
Price Waterhouse & Co.
Recorder Printing & Publishing Company
Retail Dry Goods Association of San Francisco
Richfield Oil Company
Rocca Fund, Inc., The
Rolph-Nicol Trust
Rothschild, Roffin & Weirick
St. Francis Hotel
San Francisco Foundation, The

San Jose Water Works
Shell Oil Company
Spreckels Sugar Company
Standard Oil Company of California
Stauffer Chemical Company
Steel (Marshall) Sr. Foundation
Stone & Youngberg
Strauss (Levi) Foundation
Strough (J. Val) Foundation, Inc.
Swift & Company
Title Insurance and Trust Company
Trader Vic's
Transamerica Corporation
Tubbs Cordage Company
United California Bank
United States Department of Agriculture
United States Steel Foundation, Inc.
Utah Construction & Mining Co.
Van Waters & Rogers, Inc.
Varian Associates
Walker (Clinton D.) Foundation
Walker (T. B.) Foundation
Watkins-Johnson Company
Wattis & Company
Wells Fargo Bank
Witter (Dean) Foundation
Zellerbach (J. D. and Hana) Fund

In addition to the above, a great many generous individuals, some of whom expressed their desire for anonymity, have contributed to the Academy during the year. Their help was particularly significant and is greatly appreciated.

CALIFORNIA ACADEMY OF SCIENCES

FUND BALANCE SHEETS, JUNE 30, 1966 AND 1965

ASSETS	1966	1965	LIABILITIES AND FUND BALANCES	1966	1965
			OPERATING FUNDS		
Cash	\$ 57,382	\$ 25,490	Accrued interest on note payable	\$ 88	\$ 88
Receivables			Due to Endowment Fund	254,000	254,000
Grants	50,489	52,529	Fund balances		
Other	24,419	36,681	Unrestricted (deficit)	(162,307)	(172,740)
	74,908	89,210	Contract Research, Restricted	62,986	57,270
Inventory of books, cards and other items, at cost	9,994	10,747			
Unamortized lease cost (lease expires in 1984)	12,483	13,171			
	<u>\$ 154,767</u>	<u>\$ 138,618</u>		<u>\$ 154,767</u>	<u>\$ 138,618</u>
			ENDOWMENT AND SPECIAL PURPOSE FUNDS		
Cash	\$ 49,457	\$ 33,731	Note payable to a bank, secured by pledged securities	\$ 210,000	\$ 210,000
Savings account deposits	46,266	37,988	Fund balances		
Due from operating fund	254,000	254,000	Restricted to plant additions	25,373	25,041
Investment fund, special purposes			Restricted to other special purposes	421,183	419,259
Securities, at cost (market value 1966—\$411,723, 1965—\$408,169)	350,444	325,520	Endowment	2,038,109	1,979,169
Trust savings account	390	249			
	350,834	325,769			
Investment fund, endowment (pledged)					
Securities, at cost (market value 1966— \$1,366,093, 1965—\$1,301,633)	1,267,193	1,111,806			
Trust savings account	118,832	214,287			
	1,386,025	1,326,093			
Commercial building					
Land, at cost (building costing \$516,819 is fully depreciated)	608,083	608,083			
Television equipment, net	—	31,905			
Real estate under sales option	—	15,900			
	<u>\$2,694,665</u>	<u>\$2,633,469</u>		<u>\$2,694,665</u>	<u>\$2,633,469</u>
			FIXED ASSETS		
Collections, library and equipment, at cost	\$ 949,980	\$ 942,741	Balance of fixed assets	\$ 949,980	\$ 942,741

The accompanying notes are an integral part of the financial statements.

California Academy of Sciences
San Francisco, California

We have examined the fund balance sheets of the California Academy of Sciences, as of June 30, 1966, and the related statement of general operations and statement of changes in fund balances for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying fund balance sheets and the related statement of general operations and statement of changes in fund balances present fairly the financial position of the California Academy of Sciences at June 30, 1966, and the results of its activities for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

L. H. PENNEY & CO.

San Francisco, California
August 19, 1966

CALIFORNIA ACADEMY OF SCIENCES

STATEMENT OF GENERAL OPERATIONS
FOR THE YEARS ENDED JUNE 30, 1966 AND 1965

31

INCOME	1966	1965
General		
Membership dues	\$ 39,526	\$ 39,127
Pacific Discovery	10,598	8,888
Rent from Commercial Building	130,166	119,898
Contributions, income from endowments and from special purpose funds	108,031	107,682
Grants for contract research	126,549	149,805
Public operations		
City and County of San Francisco		
Steinhart Aquarium	153,914	141,452
Museum activities	88,866	74,746
Civil Service salaries	177,787	161,189
Contributory activities		
Planetarium and instrument shop	136,230	123,053
Television	54,498	177,283
Counter sales	89,400	75,614
Rental, snack bar and miscellaneous	63,205	53,729
Totals	1,178,770	1,232,466
EXPENDITURES		
Public operations		
Steinhart Aquarium	153,914	141,452
Museum activities	101,727	89,395
Civil Service salaries	177,787	161,189
Contributory activities		
Planetarium and instrument shop	89,319	86,404
Television	53,922	300,749
Cost of sales	69,445	56,090
Scientific research and curatorial activities		
Aquatic biology	41,015	38,904
Botany	28,898	29,000
Entomology	46,634	72,599
Geology	19,862	22,174
Herpetology	21,615	20,892
Ichthyology	9,616	9,270
Invertebrate zoology	34,368	31,313
Ornithology and mammalogy	16,451	23,347
Library	29,304	33,230
Publications	27,531	17,844
Other research	39,052	27,293
Administrative and general	184,323	169,750
Contributions to employees' pension annuity	12,908	10,215
Interest	10,646	10,923
Totals	1,168,337	1,352,033
EXCESS OF INCOME OVER EXPENDITURES	\$ 10,433	(\$ 119,567)

CALIFORNIA ACADEMY OF SCIENCES

STATEMENT OF CHANGES IN FUND BALANCES FOR THE YEAR ENDED JUNE 30, 1966

	<u>Operating funds</u>		<u>Endowment and special purpose funds</u>			
	<u>Unrestricted</u>	<u>Contract research, restricted</u>	<u>Plant additions</u>	<u>Special purpose</u>	<u>Endowment</u>	<u>Fixed assets</u>
Balances (deficit), June 30, 1965	<u>(\$172,740)</u>	<u>\$57,270</u>	<u>\$25,041</u>	<u>\$419,259</u>	<u>\$1,979,169</u>	<u>\$942,741</u>
Additions (deductions)						
Gifts, bequests and grants received			600	39,786	31,528	
Income from investments			787	17,294	50,957	
Net gain (loss) on sale of securities			(26)	(1,109)	25,662	
Other receipts				7,463	1,750	
Additions to library						7,239
Expenditures for special purposes			(1,029)	(54,360)		
Appropriation of funds to general income				(7,150)	(50,957)	
Excess of income and appropriations over operating expenditures	10,433					
Excess of contract research income over restricted expenditures		5,716				
Net additions (deductions)	<u>10,433</u>	<u>5,716</u>	<u>332</u>	<u>1,924</u>	<u>58,940</u>	<u>7,239</u>
Balances (deficit), June 30, 1966	<u>(\$162,307)</u>	<u>\$62,986</u>	<u>\$25,373</u>	<u>\$421,183</u>	<u>\$2,038,109</u>	<u>\$949,980</u>

The accompanying notes are an integral part of the financial statements.

NOTES TO FINANCIAL STATEMENTS, JUNE 30, 1966

1. Fixed Assets

Buildings located in Golden Gate Park carried at \$2,354,362 are not included in fixed assets as title to buildings is vested in the City and County of San Francisco.

2. Note Payable

Securities held in trust for the endowment fund are pledged as collateral for the note payable to a bank. The note matures September 22, 1966, with interest thereon at the rate of 5% per annum payable monthly.

3. Litigation Pending

The Academy, in 1964, brought a lawsuit against J. B. Wilson and RSS Corporation for monies due on the sale and servicing of syndicated television programs in the approximate amount of \$75,000. The lawsuit has been set for trial and may be tried before the end of the calendar year.

4. Accounting Method

The California Academy of Sciences has established the practice of recording gifts and bequests only when received.



SPECIAL GIFTS AND BEQUESTS

THE Academy's various buildings — the Steinhart Aquarium, Simson African Hall, the Morrison Auditorium and Planetarium, the Mailliard Library, the Hall of Science, the projected Cowell Building and others — were built as a result of gifts and bequests. Many of the Academy's exhibits have been developed from funds obtained from similar sources.

Over the years another hidden "building" has been going on through the accumulation of gifts and bequests: the building of an Endowment Fund, the annual income from which is used to pay salaries, purchase research supplies and broaden the Academy's scientific and educational program. This is a building which will last for more than a single lifetime and which is continuously beneficial to the Academy.

You, too, may wish to consider the Academy Endowment Fund when making your annual gifts or to provide for a bequest in your will. Such investments for general or specific purposes yield dividends for many years to come and benefit not only the Academy but the entire world in which we live. For details as to needs or as to how to provide for such a gift or bequest, may we suggest you contact the Director of the Academy, any of its Trustees, or your own lawyer.

